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ABSTRACT

This volume contains working papers on a variety of topics in linguistics. They include: "A View of Phonology from a Cognitive and Functional Perspective" (Joan Bybee); "The Geography of Language Shift: Distance from the Mexican Border and Spanish Language Claiming in the Southwestern United States" (Garland D. Bills, Eduardo Hernandez-Chavez, Alan Hudson); "Rethinking the 'Power Semantic': Alternatives for the Analysis and Interpretation of Non-Reciprocal T/V Address" (Scott Schwenter); "Prototype Theory in Language and Cognition" (Patricia Escarraz); "Sociolinguistic Competence in Context: The Formality Factor" (Robin Dale Zuskin); "Male/Female Speech Patterns: Singularity versus Diversity" (Anne Wiltshire); "Supplementing the Binding Theory: On the Question of Proper Binding" (Hector A. Torres); "Some Considerations of the Use of Indices with Pronouns and Wh- Traces" (Carolyn Kennedy); "Toward a Better Understanding of Universal Grammar: Evidence from Child Language" (Teresa M. Meehan); and "Re-Examination of the Notion of Proper Binding: The Interpretation of Reflexives in Japanese" (Teruo Ueno). (MSE)

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A view of phonology from a cognitive and functional perspective

Joan L. Bybee

1. Introduction

In the last two decades there has been an active interest in viewing morpho-syntactic phenomena from a typological, functional and cognitive perspective. These research perspectives have proved extremely productive in pushing us closer to an explanation for the grammatical structures that exist in the languages of the world. Research on universals, discourse, conversation, and cognition have stretched the boundaries of linguistics and insisted on the principle that linguistic structures are dependent upon semantic and cognitive substance and the uses to which languages is put. But no movement of comparable strength has emerged which applies this principle to phonological phenomena, even though the relevance of the application is obvious: phonological structures must be dependent upon substance--phonetic substance, and they are surely molded by the uses to which they are put.

Phonological research in these same two decades has taken a number of interesting steps--the inventory of basic units has been expanded to include the syllable, the nature of the adherence of features to particular segments has been re-examined, suprasegmental phenomena have been seriously scrutinized and the interaction of syntax with phonology has been studied closely. Throughout these developments the goals of phonological theory have remained static and the basic structuralist assumptions of phonology have gone largely unquestioned. The existence of abstract underlying representations is still assumed, as is the existence of rules which make changes to these representations; it is still assumed that underlying systems are regular and symmetrical and that the prime units in phonology are distinctive features.[1]

The goal of the present paper is to outline some aspects of a program for the reconsideration of phonology in the light of certain perspectives drawn from functionalist/ cognitive linguistics and to cite past and current research that is relevant to that program. Of course, the total re-examination of phonology will be many-faceted and occupy numerous research lifetimes, but it is hoped that by sketching some points in this direction others will be stimulated to look at phonology afresh.

I start by stating some general goals for a new phonology:

• Consider the substance of phonology rather than just the structure. For syntax the substance is word meaning and grammatical meaning. For phonology the substance is largely phonetic, but generative phonology has also allowed the consideration of morphology and lexicon in the conditioning of 'phonological' rules. It is our task to distinguish the type of substance involved in any particular phenomena, for different substance conditions different types of behavior.

• Consider the uses to which phonological elements are put. Traditionally phonological variants are only considered in their 'type distribution'--the phonological

[1]Even variation theory has not fully exploited a functionalist perspective or reconsidered assumptions about underlying representations and rules, even though the data found in variation studies begs for a re-examination of all old assumptions.

environments in which they occur, much as syntax was only studied in the rarefied environment of made-up sentences. Very little study has been devoted to the distribution of phonological elements in texts. I will argue below that the text frequency of segments affects their phonetic shape and evolution.

• Consider subphonemic detail and variation conditioned lexically, morphologically and socially. Generative phonology, like its predecessor, phonemic theory, chose to ignore 'low-level phonetic detail'. Like the detail of actual language use that has enriched functionalist syntactic theory, the study of detail in phonology will reveal important facts that bear on our understanding of how language is really processed and what structures have empirical validity.

• Attend to exceptions and marginal cases, for they can be valuable sources of information about the nature of processing and representation. As I will argue below, marginal 'phonemes' are particularly interesting in their consequences for phonological theory.

• Reconsider what Langacker 1987 calls the 'rule-list fallacy' (see also Bybee 1988). Our thinking and analyses need not be restricted to only two options -- either an elements occurs in a list or it is generated by rule. I propose below that lexical elements (words or phrases) consist of actual phonetic content that is modified as these elements are used. While phonetic 'rules' may exist as articulatory patterns for the realization of words, generalizations at other levels may be better thought of as emergent generalizations over lexical representations.

2. Properties of different alternation types

The starting point for phonological alternations are the natural coarticulation and reduction phenomena that occur when language is used. Such effects quickly become involved in the expression of meaning, since the major function of language is communication. In particular, phonetic alternations become associated with particular grammatical morphemes and often also with particular lexemes. It is important to distinguish the various stages of evolution of phonological processes, because the nature of the generalizations differ according to whether the process is purely phonetic, morphological or lexical.

Phonetic alternations are motivated by motor production and produce phonetic alternates that are minimally different from one another (e.g. English [t] and [d] vs. the flap). Generalizations at this stage are statable in purely local phonetic terms. Given an appropriate notation (such as that found in Browman and Goldstein 1986), it will probably be possible one day to define substantively the maximal phonetic difference that can be phonetically conditioned. That is, given a productive phonetic process, once the phonetic change effected by this process has progressed beyond a certain limit, the results of the process can no longer be phonetically conditioned (or allophonic) but are rather reanalyzed as belonging to a different level of grammar. To use an example that will be taken up again later, the palatal variant of German /x/, [ç], which is in most environments a phonetically predictable and natural variant, I would suggest has moved too far from the velar to still be phonetically conditioned. In section 5 I will argue that it is in fact marginally phonemic. The difficulty with testing this claim is that reanalysis is covert and the surface evidence for

this reanalysis may not appear on the surface until later. Another difficulty in testing this claim is that it might require making much finer phonetic distinctions than phonologists have been accustomed to making.

An obvious objection to the claim that there are substantive differences between phonetic variants and variants that have been morphologized or entered in the lexicon is the apparent fact that for instance voiced and voiceless alternations can be of either type. Thus English has morphological and lexically conditioned alternations in words just as *house*, *houses*, *wife*, *wives*, and German and other languages appear to have the same voiced and voiceless alternation due to syllable-final devoicing. It has been shown, however, that the voiceless variant derived by this productive rule in German has not lost all the properties of a voiced stop; it is not identical to the phonemic voiceless stop either in its own properties or in its affect on surrounding articulations (Port and O'Dell 1985). Given better phonetic description and a more constrained view of productivity, we will probably find that truly productive phonological processes make very small structural changes compared to those described by non-phonetic (lexical or morphological) rules.

To the extent that morphophonemic patterns or lexical generalizations are viable and productive, their patterning is quite different from that of phonetic processes. Phonetic processes occur in strictly phonetic environments and can be viewed as the reduction or overlapping of articulatory gestures; their properties will relate to the general properties of motor gestures and the particular features of the articulatory system (Browman and Goldstein 1986, 1990, Pagliuca and Mowrey 1987a).

In contrast to phonetic processes, morphologically-conditioned alternations tend to diagram the semantic distinctions made in the morphology; they undergo diachronic changes that show that the relevant parameters for morphology are quite different than for phonology (Bybee 1985). For instance, an alternation that is morphologized may take on different properties in nouns than in verbs. Spanish stress for example is morphologized for verbs and has undergone some changes motivated by verbal categories that are different from possible changes in nouns (Hooper 1976a). A class of sounds that has undergone a phonetic change together may break apart when morphological and lexical factors intervene. For example, the alternation of /e/, /ye/ and /i/ in Spanish verbs is marginally productive, while the back vowel counterpart alternation of /o/, /we/ and /u/ under the same morphological conditions is totally unproductive (Bybee and Pardo 1981).

Not only does the domain of generalizations change in morphologization but the directionality of generalizations also changes. The basic-derived relation in morphology is based upon the semantically basic-derived relation: alternations are predicted from singular to plural, from present to past, from third person to other persons (Bybee and Brewer 1980, Bybee 1985), no matter what the original distribution of conditioning was (Vennemann 1972). As argued by Greenberg 1966, Manczak 1980, Bybee and Brewer 1980, and Bybee 1985 these relations are based in large part on the way in which forms are used: the more frequently used forms are the ones that are taken to be more basic. The directionality of phonetic processes is from a gesture unaffected by surrounding gestures to one that is reduced or overlapping or deformed by contiguous gestures.

Lexical generalizations evince yet another pattern. Lexical classes of verbs or nouns with special morphological characteristics, or stress patterns in languages where stress is partially lexicalized resemble natural categories. That is, they have the shape of generalizations that human beings make about non-linguistic categories, which includes the

ability to make use of holistic features of words as well as local ones, to group words in specific as well as general patterns and to impose a prototype structure on class members (Bybee and Moder 1983, Aske 1990 and section 6 here).

Finally, we can consider evidence available from the process of lexical diffusion--the process by which changes spread through the lexicon--as lexical diffusion provides evidence for the way that phonology and morpho-phonology interact with the lexicon. Here we see again a difference between phonetic and non-phonetic processes: phonetic changes spread gradually through the lexicon and tend to be more advanced in more frequent words. Non-phonetic alternations have a tendency to be lost (leveled) and this loss occurs earliest in less frequent items. More frequent items tend to be more conservative in non-phonetic alternations, but more innovative in phonetic ones (Hooper 1976b). Phonetic alternations are both phonetically and lexically gradual, but they do not usually have exceptions--eventually all words will fall prey to phonetic change. Non-phonetic alternations not only can have exceptions--they usually are the exceptions.

3. Phonetic substance

The phonetic material that forms the substance of phonology can be viewed in two new ways: first, rather than abstracting away and regularizing in the name of establishing a small and coherent set of distinctive features, the actual phonetic shape of linguistic units (whether at the level of the segment or at higher levels) should constitute the object of study; second, words can be regarded as consisting of real phonetic substance, in the lexicon as well as in production and perception, and this phonetic substance can be regarded as undergoing permanent change as the result of coarticulation processes.

3.1. Distinctive features

As their name implies, distinctive features are not very useful in understanding the nature of phonetically conditioned processes. Since they were developed to describe contrast they often lack the level of detail necessary to describe (and thus understand) details of coarticulation.

In addition, like other componential features from structuralist theories, their constancy across manifestations in different combinations is a fiction. Just as 'plural' does not mean the same thing in first person as it does in third person (and thus leads to the possibility of inclusive vs. exclusive, which is not possible in third person), so [continuant] does not mean the same thing for labials as it does for alveolars. There is some commonality, of course, in that a total obstruction of the vocal tract is attained, but the gestures required to accomplish this closure are completely different depending upon the point of articulation (Browman and Goldstein 1986).

This problem is more marked for the really arbitrary features such as [anterior], but even [continuant] should come under scrutiny given its different realizations in different environments. The evidence for such a feature is its ability to define a 'natural class'; the received position is that classes of stops (either voiced or voiceless) tend to behave in a uniform manner across a wide variety of languages. Of course, exceptions are well-known: [p] tends to spirantize and delete while [t] and [k] remain in tact (e.g. in Japanese, in many

Altaic dialects, in Eskimo-Aleut [Pagliuca and Mowrey 1987b]). Or consider the changes undergone by Proto-Bantu voiceless stops (Tucker and Bryan 1957, Pagliuca and Mowrey 1987b):

Proto-Bantu	*p	*t	*c	*k
Ganda	w	t	s	k
Gikuyu group	h	t	ð	k
Pokomo	ɸ	h	(d)s	k
Luhya dialects	h	(r)t	s	x

In the face of these exceptions, we might want to ask whether there is strong evidence for the feature [continuant] in the form of 'natural classes' of stop consonants. Pagliuca and Mowrey 1987b investigated this question using a sample of thirty-nine unrelated languages. They examined all allophonic processes that affect voiced and voiceless stops in these languages. They counted as 'regular' a process that affects the whole series, that is, all voiceless stops or all voiced stops in the same way. Their counts revealed that fewer than 50% of the allophonic processes affecting a stop series were regular. Only 49% were regular for voiceless stops and 42% were regular for voiced stops. This means that the chances that a stop series will behave as a natural class are 50 - 50, that is, basically random.

Of course more cross-linguistic research needs to be done on other proposed natural classes to see if any can be found which behave in the way that phonologists have assumed. In the meantime, Pagliuca and Mowrey suggest giving up the 'building block' model of phonology as their data casts doubt on the reality of features and segments. Rather, they argue that 'phone-sized' units are heavily affected by context and that a model of holistic processing for words and phrases is more realistic, a point to which we now turn.

3.2. The phonetic substance of lexical items

On the phonetic side, words or larger lexical units are auditory percepts associated with motor command patterns. What we know about other stored perceptual units suggests that detail is not factored out, but rather preserved to a large extent. The same must be the case with the phonetic representation of words. As Langacker (1987: 391-2) points out, if the phonetic regularities in words are factored out, the residue would not be "recognizable as a coherent entity plausibly attributed to cognitive autonomy." In other words, if we suppose that the perceptual representation of linguistic units, such as words, are stored in a way that is analogous to the way we store other units of perception, such as the visual representation of natural objects, then we would not suppose that redundancies are removed for storage. What this would mean, for example, for the visual representation of a human being is that the arms and legs, eyes, ears, nose, etc. could all be removed since they are predictable (with some exceptions) from the feature [+human]. If we recognize stored linguistic units as objects with cognitive autonomy, then they require a full and rich representation, with recognized regularities in their properties represented as schema at different levels.

Moreover, many empirical linguistic facts are not explainable unless words are viewed as consisting of actual phonetic substance. In this view, phonetic effects of coarticulation and reduction represent changes that are made to the actual tokens, which also affect the stored representations of words. Each new perceptual instance of an item whether through input from another person, or through self-monitoring is superimposed on existing representations and will gradually change the representation. We will consider three examples here that support this view.

Consider some English words first discussed by Zwicky 1972 and later discussed in Hooper 1976b and 1978. These are words that end in two unstressed syllables, the penultimate containing schwa followed by [r] or [l].

- In many of these words the schwa has been deleted: *every, camera.*
- In other words, however, the schwa is variably present, or at least a syllabic [r] or [l] are found to alternate with the absence of syllabicity: *memory, celery, summary, family.*
- At the far end of the continuum are words which do not have schwa-deletion at all; a full syllable is always present: *mammary, artillery.*

In Hooper 1976b I showed that the presence, variability or absence of the schwa correlated with the frequency of the word. The words of highest frequency have undergone schwa deletion completely, while the lowest frequency words do not allow the reduction at all. The role of word frequency will be discussed again in section 4 below.

What this continuum shows is that the degree to which the schwa is present is associated with a particular word or lexical unit; it is not phonetically or morphologically predictable, nor is it determinable from social factors alone. The difference in the pronunciation of *memory* and *mammary* is something that must be learned about these individual words. It is, however, something that follows directly from the input and is learned as the word is learned. If *mammary* is always heard with three syllables but *memory* sometimes is heard with two and a half and sometimes two, that is the way these words are stored. Just as detail about the meaning and cooccurrence patterns of words is acquired and stored with the word, details about its phonetic representation are also acquired and stored.

It is most reasonable to suppose that words with this phonetic environment form a continuum as each one is gradually succumbing to greater and greater reduction of this unstressed syllable. But even if we recognized three discrete groups of words -- those with full deletion, those with syllabic [r] or [l] and those with schwa plus [r] or [l], this case would still present a problem for structural theories of phonology, since syllabic [r] and [l] and schwa plus [r] and [l] do not contrast elsewhere. At the very least, one could argue that this example suggests that some rather fine phonetic distinctions can be associated with particular lexical items, which would naturally follow from the postulate that lexical items consist of real phonetic substance.

A second example of lexical diffusion of a gradual phonetic change illustrates another way that change in the phonetic shape of words can affect surface phonology. The loss of syllable-final [s], especially in the dialects of Latin America has been well-studied. The /s/ tends to lose its lingual articulation, remaining only as voicelessness (called aspiration and represented as [h]), and it eventually deletes in syllable-final position, that is, before a consonant. This occurs regularly even across word boundaries, but since Spanish

tends to re-syllabify across word boundaries, a word-final /s/ before a vowel in the next word would be syllable-initial and would not delete. The following illustrate this:

word-internally before a C: *felizmente* [felihmente] 'happily'
word-finally before a C: *o se traen animales finos* [animaleh finos]
'or fine animals are brought'
word-finally before a V: *no vas a encontrar* [...vasa...]
'you aren't going to find'

In strings of words, a word-final /s/ will sometimes appear before a vowel and sometimes before a consonant. The pre-consonantal environment is two to three times more frequent than the pre-vocalic environment. Thus the word-final /s/ is often in the environment for reduction, and our hypothesis would predict that this will have a permanent effect on that /s/. The data support this hypothesis: as /s/-reduction proceeds, word-final /s/ is eventually affected, even when it occurs before a vowel in the next word. This is not a phonetically-conditioned generalization of the process, because /s/ before a vowel inside of a word is never aspirated; the aspiration of /s/ before a vowel takes place only word-finally. The fact that the description of the situation requires that we mention word-final position in itself suggests that the reduction of this /s/ has to do with the fact that it appears in particular words in a particular position. It might be added that word-final /s/-reduction proceeds at different rates in different words (Terrell 1975, 1977 and Hooper 1981).

Another very productive, ongoing reduction process in Spanish is the spirantization of voiced stops following a vowel. The interaction of spirantization with /s/-reduction provides a third example showing that actual phonetic substance in lexical items is substantively affected by phonetic processes. If a syllable-final /s/ before a voiced stop were to delete entirely, the voiced stop would be preceded by a vowel and the right conditions for the application of spirantization would arise. Amastae 1989 reports on this situation in Honduran Spanish. His data show that the voiced stop is no more likely to spirantize if the /s/ is deleted than if it is fully there. There is no question about the productivity of spirantization, so one would expect that the newly post-vocalic stop would instantly spirantize. However, if stops in these words had been protected from reduction by the preceding /s/, and if reduction is a gradual process that affects lexical representations, then these newly-exposed stops will take a while to spirantize.

I am claiming then that lexical representations are not abstract, unchanging things that rules apply to but that in essence remain unchanged, rather they consist of substance that is gradually but permanently modified in language use. The old metaphor for this in non-Neogrammarian historical linguistics was that words are like coins that are worn down as they are passed from hand to hand. The slogan that went along with this theory was 'every word has its own history'.

This is not to deny the reality or systematicity of coarticulation patterns. Each language has associated with it a set of motor patterns or habits that strongly govern the phonetic output. My claim is simply that these same patterns have a permanent effect on the words that are filtered through them. Menéndez Pidal (1950:531) describes the interaction of phonetic patterns with lexical items using the analogy of leaves floating on a flowing river:

> Cada palabra que en fonética parezca discordante de sus análogas, puede estar sometida a una tendencia general que la impulsa en unión con las otras. Todas son llevadas por las misma corriente, como multitud de hojas caídas en un río; cada hoja sigue su curso especial, tropieza acaso con obstáculos que la desvían, la retrasan o la detienen, pero todas están sometidas a la misma fuerza, ora la arrastre, ora solamente las empuje, y sería ceguedad empeñarse en observar el curso de cada una sin darse cuenta de la corriente que las domina a todas.

The final argument (and perhaps the strongest one) for the hypothesis that words consist of phonetic substance that is permanently modified by phonetic processes is the fact that when phonetic processes become unproductive their effects are never undone. In English, the voicing of intervocalic fricatives has not been productive for a long time, as we can see by all the examples of French borrowings with voiceless intervocalic fricatives, e.g. *classes*, etc. Yet the fricatives affected by this process show no tendency to devoice -- *of* is steadfastly maintaining its [v]. The only place we see a tendency for the old voiceless fricative to be restored are in cases of alternation, where the unmarked category has the voiceless fricative, as in *house*, *houses*, where the latter is sometimes heard among younger people with an [s] rather than a [z]. This restoration is due to morphological change, not phonetic change.

4. The role of frequency

The tendency in structural phonology as in all applications of structuralism is to concentrate on structural patterns and ignore patterns of actual use. In phonology, as in morphosyntax, this means neglecting an important source of explanation for distribution patterns. The role of word frequency has been consistently neglected in phonology and even in variation studies, yet there is evidence that frequency of use is an important factor in the spread of phonological processes.

We have already seen an example of word frequency as a determining factor in phonetic reduction in the example of schwa reduction and deletion in certain English words. Given the postulate of words having actual phonetic substance, what we can say about this phonetic reduction is that the words are actually eroded in use and this erosion is reflected in their ever-changing lexical representations. Thus frequency is important, not just as a predicting variable, but as an actual causal mechanism, since words that are more frequent will be used in positions of lesser stress and emphasis and will thus be more susceptible to reduction processes.

There is also a second way that word frequency can be invoked as a causal mechanism in phonetic change. Word frequency is also a factor in the lexical diffusion of vowel shift changes, and it is not clear if any or all of such changes are reductive in nature. For instance, Moonwomon 1992 studies the backing of /æs/ and the fronting of /at/ in San Francisco English and finds that the two most frequent words with these segments, *class* and *got*, manifest the change to the greatest extent. Even if these changes cannot be considered reductive (and it seems to me that they might very well be reductive), their frequency can still be a factor in causing their advancement in the change. As

Moonwomon points out, if productive processes apply in real time as speakers speak, more frequent words will have a greater opportunity to undergo a rule than less frequent words. If the application of a process can have a permanent effect on a word, as I am suggesting here, the application of these processes, which produce only small incremental changes, will eventually accumulate a more noticeable mutation in the more frequent words.

Frequency as an explanatory factor can be used to answer some questions that phonologists have found imponderable to date. For instance, in Spanish spirantization, the labial, dental and velar stops all spirantize, but the dental stop spirantizes more regularly and becomes weaker or closer to deletion than the labial or velar stops. There seems to be no phonetic explanation of this fact. However, an explanation in language use can be found. The dental stop is much more frequent in texts than either of the other stops. Navarro Tomás 1946 reports that in a count of 20,000 phonemes in running text, /b/ accounts for 2.54% of the total, /g/ only 1.04%, and /d/ 5.00%, making /d/ twice as frequent as /b/ and nearly five times as frequent as /g/. In fact, /d/ is the most frequently occurring stop in Spanish, and among obstruents in general, it is second in frequency only to /s/.[2]

I have cited phoneme frequency here, but I do not believe that it is the frequency of the segment itself that is important. It is rather the fact that the /d/ occurs in words that are more frequent. The overall greater reduction of /d/ is due to its occurrence in some very frequent words, such as *lado*, and morphemes, such as the past participle, *-ado*.

One difficulty with various theories of consonant weakening is that while the directionality for manner of articulation (e.g. from stop to fricative, from voiceless to voiced) are regular across language, which of the various points of articulation lead the process and which lag behind differs across languages (Foley 1977). In order to make theories of weakening more predictive across languages, more factors need to be taken into account; these include language-specific phonetic factors, and may also include the distribution of consonants in frequent versus infrequent words.

The role of frequency in the reduction of grammaticizing constructions is just a special case of erosion proceeding at a faster pace in frequent than in infrequent items. Most (although probably not all) of the phonetic processes occurring in the contraction of grammatical elements have a counterpart in the much slower-moving 'normal' phonetic processes of the language. Thus the deletion of /d/ from the Spanish second plural morpheme, Latin *-atis*, Old Spanish *-ades*, Modern Castilian *-ais*, predated the general weakening of /d/ by many centuries, and would have seemed aberrant at the time. However, exactly the same change is slowly plodding through the Spanish lexicon today.

The contraction of *will not* to *won't* appears anomalous unless one considers the fact that a postvocalic /l/ before a consonant tends to vocalize to a back glide in current English, as in *milk* [miwk]. Then considering the rounded initial glide and reduced vowel followed by a back glide, the emergence of [o] is not too surprising. The advanced compression and reduction of *won't*, then is due to frequency. It is also frequency that allows this negative contraction to diverge so much from its related affirmative form. That is, *won't* is not just fused phonologically but it also has become an independent semantic or grammatical unit as well. And it is its high frequency that allows this lexical autonomy.

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[2]The phoneme /s/ has a frequency percentage of 7.5%, making it the most frequent consonant in Spanish. Perhaps this is one factor in its tendency to weaken and delete.

These examples of reduction and contraction of grammatical elements are well known and accepted (though seldom studied in their own right). What I am claiming is that this differential reduction due to frequency is pervasive throughout the forms of a language though in a more subtle and less dramatic form. The study of patterns of use, then, is likely to add a new dimension to the study of phonology, perhaps answering some of the long-standing questions persisting in the field.

5. Marginal phonemes and how they arise

If phonological processes have a permanent effect on lexical representations, phonetic elements that are not phonemic will occur in lexical representations. This in turn will lead to the development of new 'phonemes', and also to problematic cases where a phone appears to be predictable in many, perhaps most, contexts, but appears not to be predictable on phonetic grounds in a few contexts. A good example of this phenomenon of 'marginal phonemes' (which probably occur in all languages) is the palatal fricative of German. In almost all contexts, the palatal is a predictable variant of the velar fricative, occurring after front vowels and the consonants /r/, /l/ and /n/. However, the consistent realization of the diminutive suffix *-chen* contains the palatal fricative, even when the preceding noun ends in a back vowel, as in *Tauchen* [ç] 'small rope' and *Pfauchen* [ç] 'little peacock'. (These form minimal pairs with the verbs *tauchen* 'to dive' and *fauchen* 'to spit', which have the velar fricative.) Further, certain loan words contain the palatal fricative in initial position or after a back vowel: *China* [ç] and *Photochemie* [ç]. The traditional solution to this problem (Moulton 1947, Leopold 1948) is to predict the [ç] from a boundary (or juncture). This is tantamount to claiming that the [ç] is part of certain morphemes and words, which in turn amounts to lexical status for [ç].

The consistent realization of *-chen* with a palatal, even after a back vowel, arose because this suffix was represented lexically with a palatal, at first even though the palatal was predictable. Eventually the palatal is so associated with this morpheme that it occurs even outside its original phonetic environment.

Another example of a 'marginal phoneme' is the schwa in English. The schwa is clearly a reduced vowel, but in many cases it is difficult to say what it is a reduced version of. Similarly, the flap of American English is clearly derivable from a /t/ or /d/ in words like *writer* and *rider*, but is always a flap in non-alternating environments, such as in the words *butter*, *ladder*, and *latter*. In these words (actually in word such as *writer* as well) the flap is lexical.

Given the argument concerning lexical diffusion and the representation of phonetic detail in the lexicon, one could wonder why languages have small numbers of contrastive units rather than having a number of phonetic representations equal in size to the number of words in the language. Why do languages have repeated patterns that can be described as phonemes and as syllable-structure patterns rather than a totally different set of phonetic parameters for each word? There are two reasons, one involving cognitive processing and one involving motor production

The processing of words, like that of other percepts, involves a sorting and matching with other similar stored images. This means that phonetically similar elements of words will be associated with one another and common patterns will be organized into

schemas. These schemas represent motor patterns that are used in actual production. Like in any motor task that takes place with great speed and fluency, repeated patterns facilitate production. There is a tendency, then, to limit, through actual use, the number of distinct motor patterns necessary to produce speech in a given language.

6. The cognitive domain: lexical patterning

In the preceding I have been arguing for lexical storage of phonetic detail and variation where the associated 'rules' or processes have an articulatory raison d'être. In principle, these processes could be completely different in quality from 'rules' or generalizations at higher levels of cognitive functioning. However, since so little is known about the psychological functioning at any of these levels, I will not attempt a comparison, but in this section I will cite research that reveals lexical patterning at a level above the phonetic. In particular, I will discuss Spanish stress and English verb classes as matters of lexical patterning rather than as described by 'disembodied rule.'

In Bybee 1988 I argued that generalizations that have lexical and grammatical conditioning are not separable from the lexical items that they affect. In fact, in many cases it is very difficult to get speakers to apply what have been described as 'rules' to new items. My claim is that the generalizations described by these rules are not extracted and stored in a separate component, but are rather patterns or schemas that emerge from connections between stored units. Such a theory accommodates in a natural way the fact that rules with lexical and grammatical conditioning range widely between the very specific to the very general and readily tolerate exceptions.

Aske 1990 argues from experimental data that Spanish stress is best treated as a lexical pattern rather than a 'disembodied rule'. Spanish stress is predictable in nouns and adjectives in over 95% of cases by the statement that words ending in vowels have penultimate stress, while words ending in consonants have final stress (note that the crucial reference to the end of the word means that the generalization requires grammatical information):

Penultimate		**Ultimate**	
ventána	'window'	*ladrón*	'thief'
mercádo	'market'	*amanecér*	'dawn'
ciudád	'city'	*cálle*	'street'

In generative phonology this statement is canonized as rule, and exceptions to it have to be handled lexically. In early generative phonology they are marked with an abstract phonological feature, in more concrete generative phonology with an arbitrary diacritic, and in metrical phonology certain vowels are marked as 'extra-metrical' (meaning they are ignored for the purposes of stress assignment). However the exceptions are handled, they are all regarded as equally exceptional, having to be learned individually. Consequently, the rule analysis predicts that nonce or new words will be stressed according to the general rule.

Aske 1990 observes, however, that some more specific conditions may govern just how exceptional the exceptions are. While words ending in *-Vn* are overall stressed finally

change. Bybee and Moder claim that its relative lack of importance is due to the fact that the actual class of items that forms the lexical pattern or schema consists of the Past Tense forms of these verbs.

This case is important for several reasons: it shows that these past tense verbs are all stored in the lexicon and organized into a class in the lexicon. It also shows that one and the same mental faculty is used for linguistic and non-linguistic categorization, since these linguistic objects, verbs, are categorized in the same way as natural and cultural objects. It is also important that the whole word forms the basis of the categorization--including initial consonant cluster--because this demonstrates a holistic storage and processing rather than a componential or concatenative one.

Some linguists have accepted this evidence for the organization of the strong verb classes of English, while maintaining that a 'disembodied rule' also exists for the formation of the regular past tense. What is the evidence for a rule of past tense formation? The evidence traditionally cited is the fact that children acquiring English characteristically overgeneralize the regular past tense, producing forms such as *eated, comed* and *breaked.* However, a recent study of past tense formation in English by Marcus et al. 1992 which takes into account over 10,000 tokens of irregular past tense produced by children after they have begun overgeneralizing shows that the median rate of overgeneralization is 2.4%. (The average is 4.2%.) Such a low rate of overgeneralizations does not support the hypothesis that regular past tense is formed differently than irregular, which is what Marcus et al argue in spite of their data. This small percentage of overgeneralization suggests instead that regular past tense formation is just one of a number of schemas available to children. Its productivity is due to the fact that it is strongly represented, stored as it is on such a large number of verbs.

7. Some questions for the future

The purpose of this paper has been to argue for a new approach to phonology, one that is compatible with the newest cognitive and functional approaches to morpho-syntax and semantics. This approach does not assume that phonological systems are symmetrical, regular, discrete or fixed. It considers much of what phonologists analyze as rules to be residue of historical changes. Rather than reconstructing older stages of the phonology of a language, it is proposed to study the way speaker/hearers deal with phonological regularity and irregularity and how that shapes the phonology. If lexical representations are viewed as actual cognitive entities based on the realities of perception and production, it appears that individual words must contain substantial phonetic detail. Furthermore, studies of lexical diffusion show that individual words, and thus particular sounds as parts of words, are affected by the way they are used and the frequency of their use. Thus even productive processes apply differentially to individual words, suggesting that much closer attention to phonetic detail will reveal more about lexical representations. Higher level generalizations affecting lexical classes of words are also shown not to be strictly rule-like in their nature, indicating that general principles of cognitive organization can be applied to this level of phonology.

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The geography of language shift: Distance from the Mexican border and Spanish language claiming in the Southwestern United States

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Introduction

Early sociological assessments of factors that underlie the maintenance of Spanish in the southwestern United States suggest the importance of the area of geographical settlement, in particular distance from the Mexican border. For example, among 22 factors analyzed as contributing to the viability of Spanish in the U.S., Gaarder (1977: 144) lists the nearness and accessibility to an ancestral 'hinterland.' Similarly, Christian and Christian (1966: 290) note that the incidence of Spanish speakers 'is heaviest near the Mexican border, and gradually diminishes with distance from it.' In an overview of language maintenance processes appearing in the same volume, Glazer proposes that ethnic mother tongues in the U.S. are maintained longer where the groups are 'in effect, almost geographic extensions of homelands near at hand'; thus, Spanish is better maintained in the Southwest because of the 'relative ease of contact with . . . Mexico' (1966: 362). Empirical support for these proposals is suggested in a recent study by the present investigators in which we found associations of distance from the Mexican border with concentrations of Spanish speakers (Hudson et al. 1991).

However, Glazer points out that the link with Mexico 'is being broken as the immigrants become city dwellers and American citizens' (364). The role of urbanization, then, is seen to become prominent in language shift. In a study of predominantly Mexican southeast Austin, Thompson (1974) found a high level of retention among three generations of family members who had been raised in rural areas. But in those families raised in Austin, the three generation decline in Spanish home language use was dramatic. Similarly, in a survey of 544 households in Texas, Skrabanek (1970) reports a consistent decline in the use of Spanish by urban as compared to rural residents for each of three generations.

More recent studies have focused on the infusion of new speakers via immigration. A study by López (1978: 276) of Chicanos in Los Angeles concludes that 'the appearance of high language loyalty is due largely to the direct effect of continuing mass immigration.' The present investigators (Hudson et al. 1991, 1992) reach similar conclusions for the Spanish origin population of the Southwest as do Solé (1990) and Hart-González and Feingold (1990) for the U.S. more generally. Veltman (1988: 3) states the case very directly: 'The data examined make it clear that Spanish cannot survive in any area of the United States in the absence of continued immigration.'

In addition, our analysis of 1980 census data (Hudson et al. 1991) found that certain socioeconomic indicators of integration into the dominant U.S. society were strongly associated with shift away from the use of Spanish. Educational, occupational, and economic processes operating within language minority communities have direct and important consequences for the level of assimilation to the majority culture. Indeed, the conclusion was inescapable that educational and economic advance by members of the Spanish origin population are purchased at the cost of maintenance of the ancestral language.

Thus, four major factors have been found to affect the maintenance of Spanish: assimilation, that is socioeconomic integration into the dominant society; immigration, especially from Mexico; rural, as opposed to urban, residence; and distance from the international border with Mexico. The latter is the factor that is least understood both in its effect on maintenance and

in its relationship with other factors. It is eminently reasonable to assume that proximity to Mexico will have a positive effect on the use of Spanish. It might be supposed that the closer one is to the border, the greater the likelihood of interaction with speakers of Spanish. Nearer the border, as we shall see, the numbers and concentrations of Spanish speakers are greater than in more distant localities. Also, proximity encourages travel back and forth, by persons on both sides of the border, to visit relatives, for commercial transactions, and for pleasure. And distance from the border will affect the availability of electronic and print media, music, and other cultural resources in the language (cf. the related observations of Silva-Corvalán 1989: 64).

In this study, then, we investigate the role of distance in the use of Spanish. We also examine the effects on language maintenance of the other major factors and their interrelationships with distance from the border. For our analysis, we take data from the published materials of the 1980 Census[1] (U.S. Bureau of the Census 1982, 1983a, 1983b) for the 22 largest cities in the five southwestern states of California, Arizona, New Mexico, Colorado, and Texas as well as for the 401 counties in the same area, excluding the twenty that encompass the 22 cities. The cities include every incorporated area that contained within its boundaries a total population numbering 200,000 or more in 1980. For our purposes, the city data will represent the urban portion, and the counties the non-urban portion, of our urban-rural dichotomy. We also extract a variety of sociodemographic variables and three variables constructed as measures of language shift. These shift variables are all based on the use of Spanish deriving from the census question 'Does this person speak a language other than English in the home?' In addition, each city and county is scored for a 'Distance' variable according to its position with respect to seven bands marked at one hundred mile intervals from the Mexican border.

It is important to make clear from the outset that our analysis involves not individuals but the characteristics of geographic entities (cities and counties) that may be associated with language shift. Our reference is always to the numbers or the proportions of persons with particular characteristics who make up the political unit. The statistical procedures, then, are performed on the geographical units as a whole and do not address the characteristics of individuals who live in them. The focus on cities and counties permits us to examine the sociolinguistic dynamics of small political units as analogues of 'communities' and provides a way of introducing social context into large-scale census analysis.

Descriptive overview

Map 1 provides a geographical perspective on these sociopolitical units. There are counties adjacent to the Mexican border and counties as much as 700 miles away from the border. The cities considered here show an almost equally strong variation in distance from the border: from El Paso, Texas, on the border itself to Denver, Colorado, at a distance of 550 miles.

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[1]Adequate data from the 1990 U.S. Census for our analyses were still unavailable as of January, 1993. For the five southwestern states, preliminary data in CD-ROM format had been released only for Colorado, New Mexico, and part of California, and these reports contained very limited information regarding the Spanish origin population.

MAP 1 The southwestern United States: Cities and counties

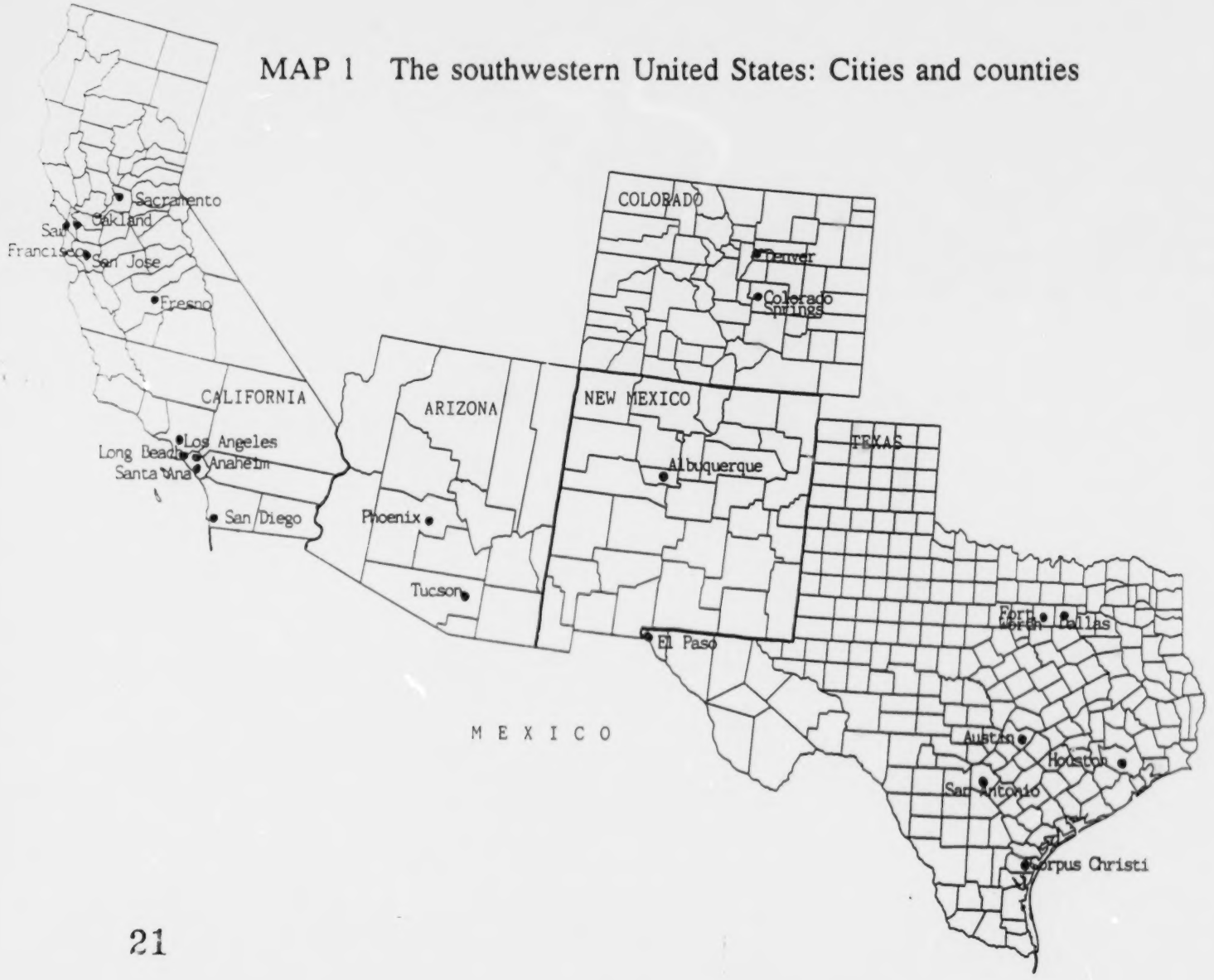


TABLE 1
Cities: Total Population, Spanish origin population,
Spanish home language claiming, and Mexican birth

	Total population	% Spanish origin	% Spanish language	% SOP born in Mexico
El Paso, TX	425,259	63	55	28
San Diego, CA	875,538	15	11	33
Tucson, AZ	330,537	29	19	15
Santa Ana, CA	203,713	44	34	45
Anaheim, CA	219,311	17	12	32
Long Beach, CA	361,334	14	9	34
Phoenix, AZ	789,704	15	10	13
Corpus Christi, TX	231,999	47	37	6
Los Angeles, CA	2,966,850	27	22	38
San Antonio, TX	785,809	54	43	11
Austin, TX	345,544	19	15	8
Albuquerque, NM	331,767	34	22	3
Houston, TX	1,595,167	18	14	25
Fresno, CA	218,202	23	15	12
Fort Worth, TX	385,166	13	10	21
Dallas, TX	904,074	12	10	25
San José, CA	629,442	22	13	17
Oakland, CA	339,337	9	7	29
San Francisco, CA	678,974	12	9	14
Sacramento, CA	275,741	14	8	16
Colorado Springs, CO	215,150	9	4	2
Denver, CO	492,365	19	9	8

For an overview of the kinds of communities represented, let us look first at some of the demographic characteristics of the cities. Table 1 lists the 22 cities in order of distance from the border. As this table shows, these cities range in population size from just over 200,000 in Santa Ana, California, to a high of nearly three million in neighboring Los Angeles, which itself is

almost twice as large as any other city in the survey.

Most of these cities have a very substantial population self-identified as 'Spanish origin' (the ethnic label employed in the 1980 Census). Los Angeles is home to over 800,000 Spanish origin claimants. Yet Los Angeles is but one of ten of these cities with a Spanish origin population (henceforth SOP) exceeding 100,000. Only Colorado Springs falls below 20,000 persons of Spanish origin. More revealing than raw numbers for an understanding of the nature of the community, however, are the proportions of this ethnic group within each city, as displayed in the second column of Table 1. The SOP actually forms the majority in two Texas cities, El Paso (63%) and San Antonio (54%). Close behind are Corpus Christi, Texas, and Santa Ana, California. In contrast, cities at a greater distance from the Mexican border tend to have smaller proportions of Spanish origin persons, ranging down to Oakland, California, and Colorado Springs, Colorado, with just 9% each. We see, then, considerable variation in the potential for ethnic group support across this sample of cities.

With regard to language, there were almost two and a half million claimants of Spanish home language (henceforth SHL) in the 22 cities considered here. Over a fourth (647,865) were residents of Los Angeles. An additional one-third lived in three Texas cities: San Antonio with 339,981; Houston with 224,169; and El Paso with 232,126. At the extreme with low numbers is again Colorado Springs, which is home to fewer than 10,000 Spanish speakers, as well as Sacramento and Oakland with under 25,000. Giving a better perspective on the community's linguistic context is the density of the SHL population within the total population of each city, as seen in the third column of Table 1. Again, El Paso stands out; fully 55% of the population of this border city is reported to speak Spanish in the home. However, in only three other of the 22 cities does more than a quarter of the population make that claim: San Antonio, Corpus Christi, and Santa Ana. Once more, cities most distant from the border -- Oakland, San Francisco, Sacramento, Colorado Springs, Denver, Dallas, Fort Worth -- tend to have rather low densities of Spanish speakers.

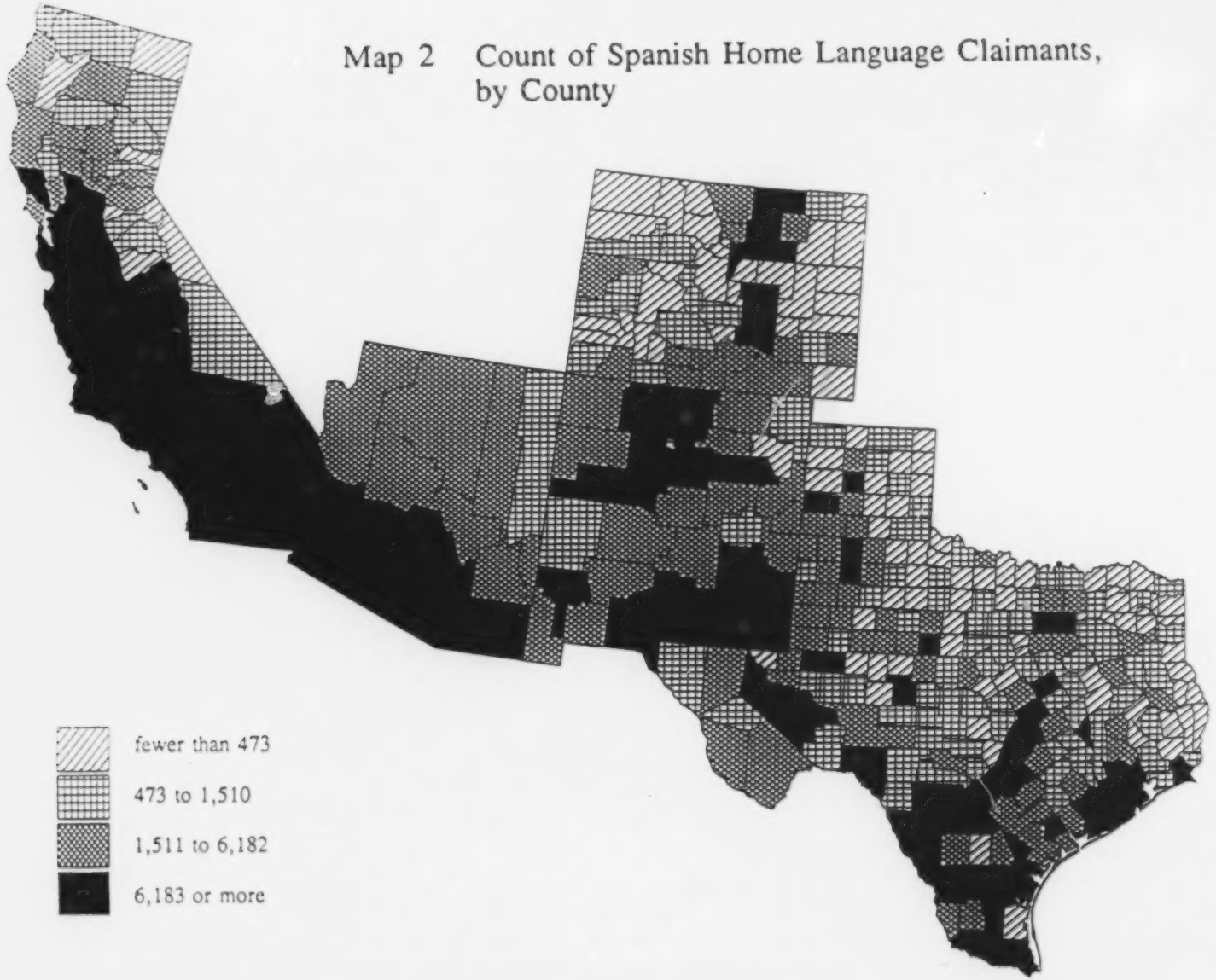
To conclude this broad perspective on the cities, the final column of Table 1 provides one piece of information on immigration, which is repeatedly shown to be important in the retention of Spanish in the Southwest. The proportion of the SOP that was born in Mexico ranges from highs of 45% in Santa Ana and 38% in Los Angeles to an insignificant 2% in Colorado Springs and 3% in Albuquerque.

With regard to counties, an overview of demographic characteristics is of course not so simple. A visual display of just one important variable will suffice. Map 2 depicts the counties in quartiles by the raw numbers of persons reported to use Spanish in the home. As with cities, there is a tendency for counties with greater numbers of SHL claimants to be closer to the border. It should also be noted, however, that every county that contains one of our large cities is in the upper quartile (those in solid black), as is to be expected of most sociodemographic characteristics based exclusively on count.

Measures of language shift

In earlier work (see Bills 1989, Hudson et al. 1991, 1992), we have examined a variety of data from the 1980 Census that might be considered to shed some light on the extent to which, in a given sociopolitical unit, Spanish is being retained or shift to English is occurring. Many people believe that relative prominence of the language minority group in a given area is a vital force in language retention. For example, the first factor on Gaarder's list of sociocultural factors that may determine whether shift will occur is

Map 2 Count of Spanish Home Language Claimants, by County



'size and homogeneity of the bilingual group,' which is judged to provide 'powerful resistance' against shift to English (1977: 141). Although size is relevant to the issue (a point to which we return below), it has been clearly demonstrated (e.g., by Hudson et al. 1991 and Hart-González and Feingold 1990) that neither raw count nor density of ethnic language speakers is in itself a good measure of language maintenance. These are static measures whereas the essence of language shift is change over time.

One way of measuring community language shift that incorporates something of a historical dimension is extractable from the census data. This assessment concerns the prominence of the language within the ethnic group itself. Taking the reasonable stance that every member of the 'Spanish origin' group is ancestrally connected to the Spanish language, we can then calculate the degree of language loyalty in the different political units. The proportion of the ethnic group that has been able to retain use of the ethnic mother tongue in the home gives us an 'apparent time' glimpse of the diachronic shift process. The general procedure permits us to establish several distinct, but related, measures of language loyalty that will be examined here. Table 2 provides this information for the 22 cities of our survey.

The first of these measures is the most general one: the ratio of Spanish language claimants to Spanish origin claimants. This shift index, which we label simply the 'Loyalty' variable, is given in the second column of Table 2. This measure reveals a strong ethnic group retention of Spanish in every one of these urban areas, with Loyalty ratios ranging from a low of 56% in Denver all the way up to nearly 100% in Dallas and El Paso.

The second measure is the degree of ethnic language loyalty among the young people. This is the 'Youth Loyalty' variable in the second column of Table 2, which shows the ratio of Spanish language claimants aged five to seventeen to the Spanish origin persons of the same age group. For each city this percentage is consistently lower than the overall Loyalty ratio, but the pattern of differences among those cities is very similar for both measures: highest percentages in El Paso, Dallas, and Los Angeles and lowest in the two Colorado cities.

Finally, the third of these shift indices we will call the 'Retention' variable: the ratio of the percent of under-18 SOP claiming SHL to the percent of those over-18 making the same claim. The Retention column of Table 2 reveals considerable differences across these cities in intergenerational loyalty to the ethnic mother tongue, ranging from a Retention rate of 93% in the border city of El Paso to just 46% in Denver.

The Distance variable

The preceding discussion gives us some idea of what to expect in the statistical association of Distance with language characteristics. It may, nonetheless, come as a bit of a surprise that the three shift variables do in fact show rather clear associations with Distance (see Table 3). The strength of the associations in all three cases suggests that the simple geographical notion of distance from the Mexican border might play a role in the mechanisms of shift to English on the part of the SOP of the Southwest. That is, the closer to the border, the stronger the tendency of both the group as a whole and the young people of the group to retain use of the ancestral language in the home, and conversely, the more distant the city or county from the border, the stronger the manifestation of shift to English.

Other factors enter the equation of course. For example, the population demographics reviewed above for cities carried several suggestions of the relevance of proximity to the Mexican border. To what extent are those demographic characteristics of the communities

TABLE 2
Cities: Three indices of shift

	Loyalty	Youth Loyalty	Retention
El Paso, TX	97	93	93
San Diego, CA	83	73	84
Tucson, AZ	88	73	78
Santa Ana, CA	90	81	87
Anaheim, CA	81	64	77
Long Beach, CA	80	66	79
Phoenix, AZ	80	59	65
Corpus Christi, TX	91	78	81
Los Angeles, CA	92	83	89
San Antonio, TX	90	80	84
Austin, TX	90	73	78
Albuquerque, NM	71	42	51
Houston, TX	91	78	81
Fresno, CA	70	50	62
Fort Worth, TX	90	76	78
Dallas, TX	98	84	83
San José, CA	66	47	63
Oakland, CA	85	73	85
San Francisco, CA	80	69	85
Sacramento, CA	65	42	59
Colorado Springs, CO	60	36	51
Denver, CO	56	31	46

really associated with the Distance variable? Table 4 provides the relevant Pearson correlations. Notice first that distance from the border shows low correlations with city and county size in 1980, whether it be the size of the total population, the SOP, or the SHL claimants. In contrast, for both cities and counties there are strong negative correlations with the proportions of the total population identified as Spanish origin or reported to speak Spanish in the home. Cities and counties located closer to the border tend to have a greater density of the SOP as well as the

SHL claiming.

TABLE 3
Cities and Counties: Pearson correlations of Distance with the shift variables

	Loyalty	Youth Loyalty	Retention
Distance of City	-.61***	-.62***	-.60***
Distance of County	-.42***	-.46***	-.43***

***p < .001

TABLE 4
Cities and counties: Pearson correlations of Distance
with selected sociodemographic variables

	Cities	Counties
N of total population	-.09	.00
N of SOP	-.27	-.25***
N of SHL claimants	-.30	-.29***
Percent of total population claiming Spanish origin	-.53**	-.62***
Percent of total population claiming SHL	-.58**	-.64***
Percent of total population born in Mexico	-.61**	-.52***
Percent of SOP born in Mexico	-.48*	-.02
Percent of SOP residing abroad in 1975	-.29	.25***
Percent of SOP residing in same county in 1975	.14	-.44***
Median years of education of SOP	.27	.44***
Per capita income of SOP	.50**	.39***
Percent of SOP below poverty level	-.26	-.44***
Percent of SOP in managerial and professional occupations	.16	.25***
Percent of SOP unemployed	.30	.17***
Persons per SOP household	-.55**	-.31***

*p < .05
**p < .01
***p < .001

More complex are the findings regarding immigration. The sixth row of Table 4 indicates that proximity of a city or county to the border is strongly associated with a higher proportion of Mexican-born persons in the total population. However, this result also appears to be in part a reflection of the relative size of the SOP; the correlation between density of the SOP and density of the Mexican-born is itself .65 for cities and .64 for counties. Consequently, when we look at Distance in relation to the percentage of Mexican-born in the SOP itself, we find that the association declines somewhat. Moreover, the parallelism between our two types of communities begins to diverge. While cities closer to the border tend to have a higher proportion of these first-generation immigrants in the SOP, there is no such association for the counties. Thus, with increased distance from the border the impact of immigration on the character of the SOP is relatively greater in non-urban areas than in the cities. Support for this observation is seen in the next two rows of Table 4. First, there is a trend (significant, though weak at .25) for recent immigrants -- as measured by the proportion of the SOP living abroad just five years before the census -- to reside in counties further removed from the border but in cities closer to Mexico. Second, a less mobile SOP (having residence in the same county five years earlier) is found in non-urban counties nearer the border, but this association between residential stability and Distance does not show up for the urban areas. Thus, the immigration factor breaks into two strands: recent immigration to less urban counties more distant from Mexico and earlier (but still first generation) immigration to cities closer to the border.

Finally, let us consider briefly the relationship of Distance to the socioeconomic condition of the SOP in these political units.The 1980 Census provides a wealth of information for such an inquiry. We examine here only a few key variables that summarize the SOP socioeconomic character of the individual cities and counties The last six rows of Table 4 show the correlations of Distance with six education, income, occupation, and household-structure variables. To interpret the most general trends first, note that in all cases the associations are in the direction that one might expect: the farther from the border, the more favorable the socioeconomic characteristics of the SOP. Proximity to the border, on the other hand, is associated with a SOP that has less education, less per capita income and a higher poverty rate, fewer high status jobs but less unemployment, and larger households. But notice also that these correlations are not especially strong, reaching .50 in only two cases, both concerning cities: median income and household size. In the non-urban counties, on the other hand, Distance is most strongly associated with median education and proportion of the SOP below the poverty level.

In sum, distance from the Mexican border is clearly associated with language shift as it is being measured here, whether that shift is taking place in cities or in non-urban counties. In addition, however, Distance is associated with other characteristics of a sociodemographic nature, some of which reveal urban-nonurban differences. Most important among these other factors are those dealing with immigration and socioeconomic status, since these variables also relate to language shift, a question to which we now turn.

Sociodemographic characteristics and language shift

Researchers consistently identify two powerful, but competing forces important influences on the process of language shift: immigration and assimilation. Urban settings such as the 22 cities treated here should be especially susceptible to both of these forces. On the one hand, cities tend to attract immigrants who speak (often exclusively) the ethnic language, and this is so in the case of Spanish in the Southwest, whether these persons come directly from Mexico or from rural areas in the United States. This constant 'urban renewal' helps to maintain the ethnic

language, both in reinforcing use of the language by the earlier arriving members of the ethnic group as well as in simply replacing the more assimilated who move to the suburbs and other greener pastures. At the same time, however, it is particularly in the urban areas that we encounter powerful societal pressures to shift to the dominant language. Not only is English usually needed for participation in the city outside the home and the ethnic community, but the social evidence appears everywhere that socioeconomic success is the province of the English-speaking. Correlations of our three shift variables with selected demographic and socioeconomic characteristics of the SOP that relate to these other forces are presented in Table 5.

TABLE 5
Cities and Counties: Pearson correlations of the shift variables with selected sociodemographic characteristics of the Spanish origin population

	Loyalty		Youth Loyalty		Retention	
	City	County	City	County	City	County
% born in Mexico	.48*	.20***	.56**	.30***	.65***	.28***
% living abroad in 1975	.34	.13**	.41*	.11*	.53**	.09
Median years of education	-.62***	-.65***	-.61***	-.72***	-.49*	-.65***
Per capita income	-.48*	-.58***	-.43*	-.60***	-.27	-.53***
% below poverty level	.26	.41***	.30	.54***	.22	.50***
% managerial and profession occupation	-.40*	-.41***	-.42*	-.46***	-.37*	-.39***
% unemployed	-.65***	-.27***	-.56**	-.16**	-.42*	-.08
Persons per household	.52**	.36***	.51**	.55***	.40*	.56***

*p < .05
**p < .01
***p < .001

Reflecting the findings of the preceding section, two characteristics of the SOP prove to be important in assessing the influence of immigration on Spanish language retention: the proportion born in Mexico and the proportion living abroad in 1975. The Mexican nativity variable has significant correlations with all three shift variables. As the first row of Table 5 demonstrates, in the case of cities, Mexican birth is modestly correlated with the Loyalty variable and more strongly correlated with the two variables that tap into generational concerns: Youth Loyalty and Retention. In non-urban polities the association with maintenance is much weaker. It is clear, however, that immigration from Mexico exerts some influence on the use of Spanish

in Southwest cities and counties, especially among the youth. Moreover, whatever the precise form of the connection between immigration and Spanish retention might be, the mechanism is more an urban phenomenon.

It might be expected that recent immigration would have a still more powerful influence in this respect. However, the second row of Table 5 shows that the proportion of the SOP reported to have been living abroad five years before the census has unexpectedly low correlations with the shift variables, especially for counties. There is but one salient exception: the Retention variable for cities. In cities having a higher ratio of recent immigrants, the SHL claiming of the youth more closely approximates that of the adults.

The second powerful force on Spanish language retention, assimilation pressures, may be assessed by means of the same six socioeconomic variables treated in the previous section. The correlations of the three shift variables with these SOP characteristics of individual political units are seen in the final rows of Table 5. Median years of education is strongly correlated with all three linguistic variables in both cities and counties: the more highly educated the SOP, the smaller the proportion of SHL claiming in each case. The association of Spanish speaking with lower levels of education is, of course, a readily perceptible social fact and represents one form of social pressure to abandon Spanish.

The two income variables also show significant associations with Spanish maintenance. We may note first of all that for both cities and counties, the average per capita income of the SOP shows negative correlations while the percent of this group in poverty level status shows positive correlations. Interpretation is straightforward: the more the income and the lower the poverty rate, the less the Spanish. The fact that these correlations are much less striking for cities than for counties is due simply to the fact that there is very little variation among the urban areas in these SOP economic indicators while the range is much greater across the counties.

With regard to occupation, we see that the degree to which the SOP of a city or county is employed in high status occupations is, predictably, associated with shift to English. Again, the general picture that emerges as a transparent social fact is that economic success is linked to abandonment of Spanish. The other occupational variable, the percent of the adult SOP that is unemployed, yields a result that may seem counterintuitive at first. The negative correlations indicate that higher levels of unemployment correspond to lower rates of SHL claiming. We interpret this finding as follows: where there is high Spanish claiming a relatively high proportion of the SOP may be employed, but in menial, low-paying jobs, and more individuals in the SOP may be marginalized from the social service system that provides the statistics on unemployment. The fact that this association is far stronger in the cities supports our suspicion that participation in the network of official unemployment is a form of assimilation.

Finally, such a simple societal feature as number of persons per SOP household reveals a fairly strong association with all three of the variables. Once more, Spanish as a home language is seen to be associated with a tradition of large families that is itself associated with low level of education (-.62), low per capita income (-.46), and low level of high status employment (-.53).

Table 6
Multiple regression analysis for counties

	r*	r^2	R	R^2	ΔR^2
Loyalty					
1. Median education	-.65	.42	.65	.42	
2. Distance	-.53	.29	.71	.50	.08
3. Abroad in 1975	.13	.02	.74	.55	.05
4. Per capita income	-.58	.34	.75	.57	.02
5. Unemployment rate	-.33	.11	.77	.60	.03
Youth Loyalty					
1. Median education	-.72	.52	.72	.52	
2. Distance	-.53	.28	.76	.58	.06
3. Mexico-born	.31	.09	.78	.61	.03
Retention					
1. Median education	-.65	.43	.65	.43	
2. Household size	.56	.31	.68	.47	.04
3. Mexico-born	.33	.11	.71	.50	.03
4. Distance	-.46	.21	.73	.54	.04

*Any discrepancies between the r's here and elsewhere in this report are due to the necessity of using listwise deletion for the multiple regression whereas pairwise deletion is more suited for the general correlations.

The best predictors of shift

The Distance variable produces substantial and highly significant correlations with all three measures of language shift, for the 22 cities as well as for the 401 non-urban counties. Nevertheless, the preceding discussion of immigration and socioeconomic factors makes it clear that it is not simply the distance of a city or county from the Mexican border that accounts for language shift. However, it is also not simply that the Distance and socioeconomic variables are measuring the same thing. As we saw above (see Table 4), the correlations with Distance are not overwhelming for either the immigration or the socioeconomic variables.

The question that remains is whether the statistical association between language shift and Distance reflects a direct causal relationship, or whether it represents the effect of one or more of these other variables which are associated with both distance from the border and with shift. In order to explore this possibility, the three shift variables were independently regressed on eleven predictor variables that include Distance itself besides a variety of sociodemographic

variables. The results of the regression are summarized in Tables 6 and 7.

Considering first the 401 non-urban counties, Table 6 shows that the single highest predictor of language shift in every case is the median number of years of education completed by the SOP of the county. In the case of Loyalty, for example, the ratio between SHL claiming and Spanish origin claiming is negatively correlated (r = -.65) with SOP educational level. Once the effect of education is partialed out, however, the effect of distance from the border emerges as a nontrivial second order predictor of language loyalty in the SOP as a whole and in the SOP aged five to seventeen years, contributing an additional 8% and 6%, respectively, to the explained variances. In the case of Retention, however, Distance emerges only as the fourth most important predictor, after education, household size, and Mexican nativity, though it still accounts for an additional 4% of the explained variance. For the counties, then, the paramount force in language shift is education, a socioeconomic factor reflecting assimilatory pressures. Yet Distance also proves to carry a consistent, though less powerful association with shift, and it will be noted that immigration (as measured by one or the other immigration variable) turns up as a significant third order predictor for all three shift indices.

Table 7
Multiple regression analysis for cities

	r*	r^2	R	R^2	ΔR^2
Loyalty					
1. Unemployment rate	-.65	.42	.65	.42	
2. Distance	-.61	.37	.78	.61	.19
Youth Loyalty					
1. Distance	-.62	.39	.62	.39	
2. Median education	-.61	.37	.77	.60	.21
Retention					
1. Mexico-born	.65	.43	.65	.43	
2. Employment rate	-.42	.18	.75	.56	.13

*See explanation in Table 6.

Turning to Table 7, the multiple regression for the 22 cities yields a very different display from that of the counties, as well as less homogeneity across the three shift variables. For Loyalty, the highest predictor is the SOP unemployment rate, a special manifestation of integration into the mainstream, as argued above. Distance, however, figures prominently also, contributing fully 19% of the variance beyond the 42% explained by unemployment. In the case of Youth Loyalty, Distance surfaces as the single most powerful predictor at 39%, combining with educational level to explain 60% of the variance. Finally, with regard to Retention, the immigration variable of Mexican birth comes to the fore, though unemployment also contributes a strong 13% to the explained variance. Thus, all three kinds of impact on language shift -- assimilation, immigration, and distance from the border -- seem to play a role in the urban areas.

Conclusions

This exploration of 1980 Census data for Southwest urban areas and non-urban counties demonstrates that distance from the border enters into an understanding of the process of language maintenance and shift in an important, though secondary, way. For both cities and counties, proximity to the border favors retention of Spanish on the part of the SOP while greater distance favors shift to English. The most straightforward interpretation of this result must be that location closer to the border increases the possibilities for contact with those who are monolingual in Spanish. Residents nearer the border are likely to have more frequent contacts with relatives and businesses on the Mexican side of the border as well as greater interaction with Mexican citizens crossing the border into the U.S. for business or pleasure.

But in addition to opportunity for use of the language, there is likely to be a more favorable attitude toward Spanish deriving from community and institutional support. It was noted above that the proportion of the SOP and of Spanish speakers in the total population tends to be higher in those sociopolitical units that are closer to the border. Such strength in numbers may well promote a more positive evaluation of both the ethnic group and the language. On the other hand, the relative weakness of cultural support in numerical terms at greater distances from the border should correlate with weaker recognition of ethnic identity, thereby facilitating assimilation into the mainstream.

These interpretations also apply to understanding the relatively stronger influence of distance in the cities than in the non-urban areas. In the counties, Distance may be viewed almost literally as an assimilation variable, adding to the paramount education variable a composite of integration features that accumulate with distance from Mexico. But the urban situation is more complex. With regard to the Loyalty variable for cities, distance may be viewed again as a composite assimilation measure, once more surfacing as a second order predictor, though it is much more independently powerful in cities, where we find the stronger assimilation pressures. On the other hand, the fact that Distance is the single best predictor of urban Youth Loyalty -- the proportion of SHL claiming by those under eighteen years of age -- seems to follow naturally from the decline in density with distance: language acquisition is determined solely by opportunity. Opportunity for acquisition also explains why Distance <u>fails</u> to show up as a predictor of Retention, the degree to which youth loyalty approximates adult loyalty. The Spanish origin persons in the Southwest most likely to speak Spanish in the home are those born in Mexico and, consequently, among the young it is their children who are most likely to be SHL claimants. Though cities closer to the border tend to have greater Mexican nativity among the SOP, the Retention variable seems to be susceptible to the individual immigrant as a language transmitter and not to the community support that Distance seems to reflect.

The Distance variable, then, appears to be a kind of surrogate measure of integration into mainstream U.S. society. Its associations with language shift are important, though clearly intertwined with other phenomena such as urbanization, immigration, and socioeconomic status. Proximity to Mexico, immigration from Mexico, and insulation from the mainstream tend to favor retention of Spanish while their opposites conspire to promote shift to English, particularly in the urban setting.

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Rethinking the "Power Semantic": Alternatives for the Analysis and Interpretation of Non-Reciprocal T/V Address[1]

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Introduction

Owing primarily to Brown & Gilman's 1960 paper "The Pronouns of Power and Solidarity," the study of *tu/vous* pronouns was a prolific topic during the early years of sociolinguistics. These pronouns, generally abbreviated as T/V, represent different ways to address second person interlocutors, similar to English *you*.[2] More specifically, the T pronoun generally represents "familiarity and intimacy," while the V pronoun represents "formality and politeness."[3] The T/V labels, taken from the French forms, have come to denote the corresponding pronouns in languages which have such a distinction.

Since the appearance of the original Brown & Gilman article, a multitude of studies on T/V-type systems in numerous languages and language families has been realized (for more comprehensive overviews of T/V, see Mühlhaüsler & Harré 1990; Robinson 1978; Wainerman 1976). However, although Brown & Gilman's "Solidarity Semantic," governing reciprocal address, has been generally accepted by researchers, the construct regulating non-reciprocity, the "Power Semantic," has received far less scrutiny. The objective of the present paper is thus to advance new theoretical and methodological concepts for the examination of T/V non-reciprocity, and also to report on an empirical study which implemented these concepts.

Before entering into a critique of the "Power Semantic," it will be beneficial to present an introduction to Brown & Gilman's notions of T/V address patterns. The next section provides a brief overview of their theory of the sociolinguistics of T/V pronouns.

Brown & Gilman's Theory of T/V

First published in 1960 (I will refer to the 1972 reprint herein), Brown & Gilman's seminal paper "The Pronouns of Power and Solidarity" focused its probe of T/V pronoun phenomena on European languages exhibiting this system. Generally, the authors were concerned with two issues: (1) the semantics of the pronouns of address, or the "covariation between the pronoun used and the objective relationship existing between speaker and addressee" (1972:252); and (2) expressive style, or covariation between the pronoun used and characteristics of the person speaking (1972:252-3). Through analysis of these issues as applied to historical and literary sources, Brown

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[1] This paper was presented at NWAVE XXI, held at the University of Michigan; and also at a University of New Mexico Department of Linguistics Graduate Student Colloquium. I am grateful to Alan Hudson and Otto Santa Ana for helpful comments and criticism. Finally, my most sincere thanks go out to the Alicante interviewers; this paper would not have been possible without their gracious assistance.

[2] The T/V distinction usually obtains in both singular and plural pronominal forms. To the extent that the sociolinguistic study of T/V pronouns has focused in a nearly exclusive fashion on the singular forms, no analysis of the plural forms will be advanced in the present paper.

[3] As one may imagine, the semantics of these pronouns are not always so fixed; indeed, their variability will be evident from this paper. Nonetheless, the general framework proposed by Brown & Gilman (1972), which I critique herein, designates T/V in this manner.

& Gilman concluded that T/V pronominal address was governed by two types of regulatory "semantics": power and solidarity.

The first semantic, that of "power," defines the relationship between two interlocutors, one of whom can control the behavior of the other, and is thus designated as holding power, in relative terms, over the other individual (Brown & Gilman 1972:255). This demonstration of power, additionally, implies non-reciprocal address between the two interlocutors, with V directed at the superordinate individual and T at the subordinate within the dyadic relation. The "solidarity" semantic, in contrast, finds its application between interlocutors who share certain social characteristics which lead them to address each other in a reciprocal manner, whether through utilization of symmetrical T or V. The instance in which speakers employ mutual V originates as a consequence of the equality of age or social status which they share, in combination with a common lack of familiarity. Reciprocal T between speakers, on the other hand, arises in contexts of approximate social or age equivalence as well as previous familiarity, becoming stronger within symmetric relations between siblings, and reaching hypothetically maximal levels between identical twins (Brown & Gilman 1972:258). A more concise statement of Brown & Gilman's theory has been assembled by Braun (1988:19), into what she calls two "important regularities":

> (1) Reciprocal use of address variants signals either mutual distance (e.g., with the V pronoun) or intimacy (T pronoun), while status differences are ignored or reformulated into degrees of intimacy/distance.
> (2) Nonreciprocal use of address variants signals status differences, with the V pronoun... being used upwards and the T pronoun... being used downwards.

Within the present work, I will be concentrating on the second characterization listed above, that which confronts non-reciprocity. The reason for this focus is that, in contrast to the Solidarity Semantic, the Power Semantic has not been empirically validated by T/V investigators following in the tradition of Brown & Gilman (cf. Fasold 1990:29-30). Specifically, Brown & Gilman's argument that non-reciprocal address arises as a result of power differentials and the controlling ability of one person over another will be called into question, and a distinct explanation, which sees interlocutor social distance interacting in a significant manner with institutionalized norms of deference, will be advanced.

An Alternative Interpretation of Non-Reciprocal T/V

I shall focus on two oft-recurring asymmetrical patterns which the "Power Semantic" has not adequately explained: firstly, address between older and younger persons, in which the former receive V yet give T to the latter; and, secondly, the fact that females, not males, have been more often the recipients of non-reciprocal V. As we will see, it is very difficult to posit "power as controlling ability" as the factor which influences pronoun use in these cases of non-reciprocity. Rather, these instances are more easily accounted for by a theory which considers: (1) the importance of the social distance between the interlocutors, defined as the similarity/difference of social attributes and the degree of intimacy which individuals have, both of which are dependent on the situational context (Schwenter, forthcoming); (2) the nature of deference, or the "symbolic means by which appreciation is regularly conveyed to a recipient...or of something of which this

recipient is taken as a symbol, extension, or agent" (Goffman 1956:477); and (3) the interaction between the first two which, in turn, can cause non-reciprocal T/V address to arise.

From a diachronic perspective, the trend towards a non-power-based view of non-reciprocal address is parallel to Brown & Gilman's original observation that many formerly power-governed relations within society were being reinterpreted in terms of solidarity. Accompanying this shift, some formerly power-governed relations retained non-reciprocal T/V due to the type and degree of social distance between the interlocutors. This reanalysis of previous power-linked relations in society in terms of relative social distance has, in many cases, been institutionalized, which accounts for the fact that, contrary to Brown & Gilman's prediction (1972:282), not all T/V address has become reciprocal and solidarity-regulated. The synchronic result of this historical development is that actual dyadic power relations are no longer as relevant to T/V choice; instead, the relative social distance of the speakers is considered, and pronoun use within the dyad is determined by the interaction of this social distance with the institutionalized norms for deference, which many times emanated from former power relations within society.

The first typical pattern of non-reciprocal address, then, is one in which a younger person of high social status gives V yet receives T from an older person with lower social status; this pattern was noticed in Italy between housemaids and the family's children (Bates & Benigni 1975). According to Brown & Gilman, this use is Freudian in nature: to the extent that parents are authority figures for their children, so too are all elders (1972:256). Thus, those persons who are recipients of asymmetrical V during a person's lifetime represent parent figures. Brown & Gilman's *ad hoc* characterization of such situations is evidence of a severely limited view of non-reciprocal V use as "obeisance, submission, and propitiation that someone under authority gives to someone in authority" (Goffman 1956:478-9). Rather, as Goffman illustrates (1956), deference is usually ritualized and symbolic within society; there exist some typical relations between deference and social distance which are ceremonial in nature. In addition, the T/V address patterns which arise from these norms of deference can be oblivious to actual interlocutor power relations or their feelings toward each other. The frequent pattern of non-reciprocity between interlocutors who are socially distant due to age thus represents a classic case in which such social distance interacts with norms of deference, and is manifested through the T/V pronoun exchange.

The second commonly occurring non-reciprocal pattern with which I am concerned, that in which women are more commonly recipients of asymmetrical V, is explained by Brown & Gilman by the fact that women have traditionally had more social power than men (1972:261). If one finds this position valid, then obviously this type of non-reciprocal pattern can be reclaimed as an instance of the "Power Semantic." However, I tend to side with Fasold (1990:30), and a myriad of researchers investigating gender issues, who would dispute this claim. A more plausible explanation for this non-reciprocal pattern is that it preserves the appearance of "appreciation through deference" in the face of a real power differential. Thus, it is not the case here that a former power-regulated relationship has been reanalyzed; rather, it is an institutionalized norm which has remained stable in the communities in which the pattern prevails.

The thesis presented here in favor of the roles of social distance and deference for the explanation of T/V non-reciprocity does not necessarily claim that all power-regulated asymmetries have disappeared, since there exist dyads in which power differentials still may determine T/V use. The view tendered here, however, is more capable of explaining both widespread societal T/V patterns which are inexplicable through reference to interlocutor power differences, as well as individual alterations in use which vary according to the situation or specific purposes of the speaker. Hence it is clear that the previous emphasis on power as the causal element in T/V non-

reciprocity needs to be shifted to a broader perspective which sees social distance and deference as interacting in a significant manner.

The next section provides an outline of some methodological suggestions for the study of T/V address in general.

Methodological Directions for Research on T/V

At the outset, it was observed that T/V pronouns had a fruitful existence throughout the early years of sociolinguistics. Despite this previous attention, during the last ten years or so interest in the topic has waned considerably. I hypothesize that T/V's loss of attractiveness as a field of inquiry is principally due to two factors: first, as seen above, the scarcity of theoretical innovation in the study of T/V pronouns since Brown & Gilman has caused it to stagnate; and secondly, in explicit connection with the first item, the lack of methodological diversity has spawned a mass of indistinguishable questionnaire-based studies which rely solely on self-report as their primary data source.

The quandaries which result from self-report data have been very well-known to sociolinguistics since the field's beginnings. As regards T/V pronouns, the few attempts that researchers have made to obtain further "real-life" corroboration of their subjects' usage have resulted in discrepancies. Bates & Benigni (1975), for example, uncovered what they termed "idealized address" within questionnaire/interview data, which disagreed with selection patterns observed while accompanying a few of the subjects in public. Even within the questionnaire itself, as a study by this author illustrated (in press), speakers are not able to correctly explain the factors which influence their patterns when asked to comment on such determinants.[4]

Obviously, methodologies which are unobtrusive to the interlocutors' behavior are necessary. As an alternative to the macro-level, quantitative ambitions of the questionnaire techniques, we demand a method which permits compilation of large quantities of data, but does not require an overt hypothetical response from the individuals under study. Clearly, there are various options open for such a technique, as both existing sociolinguistic methods and innovative ones could be devised. Due to space limitations, I would like to briefly comment on one of these existing methods: the rapid and anonymous survey.

The rapid and anonymous survey methodology entails the elicitation of a linguistic variable from respondents in public situations. Normally, the investigator asks a question to evoke the variable under study, and then records the respondent's usage after leaving the encounter (cf. Milroy 1987; Moreno Fernández 1990). First implemented by Labov in his New York City department store study (1966), this procedure produces a minimal effect on the subject which is fundamental for valid characterizations of T/V use in real-world situations. Furthermore, the rapid and anonymous survey permits manipulation of both investigator and subject variables in a non-reactive way. This combination of attributes makes the rapid and anonymous survey an ideal method from which to study T/V pronouns in general, since it allows massive data collection, with a small amount of subject awareness, in very short periods of time.

Of course, there are shortcomings to a rapid and anonymous survey approach, such as the lack of objective data obtainable on the subjects. Nevertheless, as was illustrated by Milán (1974),

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[4] This study was a comparison of Spanish and Mexican adult T/V use in which the respondents were asked to, among other things, comment on their own usage. Interestingly, the commentary provided by each respondent group actually described the usage of the other group; that is, Mexicans' comments more accurately reflected the usage of the Spaniards, and vice versa.

the technique is easily modified to procure such information, and also readily applicable to linguistic phenomena other than phonological variables. Thus, my suggestion is not that we make the rapid and anonymous survey the exclusive method for the collection of T/V data; but rather, that we design techniques which utilize an unobtrusive, non-reactive approach in an effort to negate the dilemmas created by self-report data.

I now turn to an empirical investigation of T/V non-reciprocity in which the theoretical and methodological proposals tendered above were implemented.

An Empirical Study of T/V Non-Reciprocity in Alicante, Spain

Application of the rapid and anonymous survey technique to the study of T/V non-reciprocity was carried out during May-June 1992 in Alicante, Spain. Alicante is a city of approximately 300,000, located on Spain's southeastern Mediterranean coast. The survey was performed on city sidewalks by four interviewers, who requested directions from strangers. The fact that the subjects were strangers is of great importance, as is the brevity of the encounter: both these characteristics make postulation of one person's controlling ability over another difficult. On the other hand, if strong non-reciprocal patterns arise, I believe that they can be appropriately considered to result from institutionalized patterns of linguistic deference stemming from certain differences in speaker variables such as gender or age which are indicative of the social distance between the interlocutors.

The four interviewers were all Alicante natives varied by gender and age: two males ages 47 and 25, and two females ages 46 and 24. All interviewers dressed in what could be considered an inconspicuous "middle class" style. In addition, the interviewers were trained by the author to carry out the study, which they all mastered with ease after a couple of hours of practice survey work.

Subjects were selected in accordance with three variables: gender, age, and outward appearance. In addition to the male/female selection, the age variable was split into three groups: 18-30, 31-50, 51+; these categories were determined mainly because of the confidence expressed by the interviewers in selecting from such age ranges. Furthermore, subjects were selected by their outward appearance, mainly their style of dress, and divided into those the subjects believed to be dressed better and those worse than themselves. In the end, this variable was found to play no role whatsoever in the results of the study, and thus will not be discussed further. Nonetheless, it was deemed an important component in subject selection since people can be aware of others' dress. Also, to the extent that it could represent a marker of social status differences, the inclusion of this variable was important in that it aided us in disconfirming part of the status/power-based argument.

Regarding the procedure of the survey itself, all interviewers followed the same route along the Alicante city sidewalks. Using a T/V pronoun, requests for directions to a nearby locale were made in order to keep the interaction brief.[5] In addition, the questions were framed in such a way as to compel the subjects to answer with a verb marking the T/V pronoun, which is obligatory in Spanish.[6] A sample exchange between interviewer and informant would be as follows:

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[5] The success of this "rapid" technique is evidenced by the fact that the vast majority of interviewer-subject encounters lasted less than twenty seconds.

[6] To my knowledge, all languages which display a T/V pronoun distinction also mark this distinction through verbal inflection.

Interviewer: Perdón, señora, ¿me puede decir cómo llegar a la estación de autobuses? ('Excuse me, ma'am, could you (V) tell me how to get to the bus station?')

Subject: Sí, sigues recto y en la esquina doblas a la izquierda ('Sure, you (T) keep going straight and you (T) turn left at the corner.')

The success of the request design was indisputable: only those subjects who didn't know directions failed to provide a T/V-marked verb or pronoun. The data was recorded into a notebook by the author, who followed a short distance behind the interviewers. Finally, for ease of comparability and consistency, the pronoun "given" by the interviewers was standardized in accordance with the age of the subjects. Thus, the youngest age group (18-30) was accorded T only, the middle age group (31-50) both T and V as equally as possible, and the oldest age group (51+) V only.[7]

Results of the Alicante Study

510 dyadic interactions, distributed evenly among the four interviewers, were obtained. The percentages of non-reciprocal address received by the interviewers can be seen in Tables 1 and 2.

TABLE 1: PERCENTAGE NON-RECIPROCAL ADDRESS RECEIVED: INTERVIEWERS 1 & 2

SUBJECTS			Interviewer #1 (male, age 25)		Interviewer #2 (female, age 24)	
Sex	Age	Pronoun Given		(Tokens)		(Tokens)
M	18-30	T	00	(22)	00	(22)
	31-50	V	70	(10)	80	(10)
	31-50	T	00	(11)	00	(10)
	51+	V	87	(23)	64	(22)
F	18-30	T	00	(18)	00	(19)
	31-50	V	85	(13)	100	(11)
	31-50	T	00	(10)	00	(11)
	51+	V	80	(24)	83	(24)
				N=131		N=129

[7] The determination of which pronoun(s) to use with the different groups was made after consultation with the interviewers, and also following a week of preliminary observation of T/V use in the community. Since the objective of this study was a valid characterization of real-life T/V use, I decided not to implement T/V usage which would clearly violate established norms. Nonetheless, the manipulation of the interviewer's pronoun could prove interesting in a study of people's responses to unexpected or norm-violating address.

Looking at Table 1, we find that these younger interviewers always received reciprocal address when they addressed subjects with T. Furthermore, the majority of responses from the oldest age group subjects was also T, in spite of the fact that these strangers were categorically given V by the interviewers. Together, I interpret these two patterns to be evidence for the fact that the age category which includes interviewers 1 and 2 is one which is not accorded deference, regardless of the social distance between the interlocutors; hence, younger persons overwhelmingly receive T, even though they may have initiated the encounter with V.

TABLE 2: PERCENTAGE NON-RECIPROCAL ADDRESS RECEIVED: INTERVIEWERS 3 & 4

SUBJECTS			Interviewer #3 (male, age 47)		Interviewer #4 (female, age 46)	
Sex	Age	Pronoun Given		(Tokens)		(Tokens)
M	18-30	T	50	(20)	55	(20)
	31-50	V	00	(11)	07	(13)
	31-50	T	27	(11)	25	(8)
	51+	V	24	(21)	14	(21)
F	18-30	T	67	(21)	50	(22)
	31-50	V	00	(12)	09	(11)
	31-50	T	25	(8)	11	(9)
	51+	V	14	(21)	24	(21)
				N=125		N=125

In contrast, Table 2 illustrates a very distinct pattern for interviewers 3 and 4. When these individuals gave T to the youngest age group, the respondents returned nearly equal amounts of deferential V and reciprocal T; in these dyads, the participants' age difference can be relevant to T/V, as when the older persons received the more deferential form. Nonetheless, this appears to be a dyadic configuration where the norms of T/V use are somewhat in flux, and further age breakdown among the subjects would be beneficial. Additionally, interactions with subjects from the oldest age group also differed from those seen in Table 1: with interviewers 3 and 4, these subjects returned reciprocal, deferential V as opposed to the widespread non-reciprocal T addressed to interviewers 1 and 2. In this case, although there is age-based social distance, it is not great enough to cause strong patterns of non-reciprocity.

Along with the strong patterns of T/V variation which stem from age differences, both tables show some variance as regards gender, although these shifts are not nearly as great. In order to test all these factors for statistical significance, analyses of variance (ANOVA) were done; the ANOVA results appear in Table 3.

TABLE 3: ANALYSIS OF VARIANCE (ANOVA)
DEPENDENT VARIABLE: SUBJECT PRONOUN

	Main Effects	
Independent Variable	F-Ratio	Significance of F
Gender of Interviewer	157	p=.692
Gender of Subject	.487	p=.485
Age of Interviewer	307.439	p<.0001
Age of Subject	4.959	p<.007
Interviewer Pronoun	59.132	p<.0001
Two-Way Interactions		
Interviewer Age/Pronoun	11.141	p<.001

Looking first at the gender variable, we see that these differences were completely insignificant as regards the dependent variable, i.e. the pronoun returned by the subject. Thus, neither the gender of the interviewer nor that of the subject was relevant to the latter's T/V choice. On the other hand, both the age of the interviewer and that of the subject had great effect on the dependent variable, as these results were highly significant statistically. These findings thus confirm the patterns noted in Tables 1 and 2: degree of age difference is highly relevant to non-reciprocity and T/V selection in general, and the strength of these patterns are an indication of the highly institutionalized nature of non-reciprocal address. Additional support is provided by the two-way interaction between the age of the interviewer and his/her pronoun. These factors interact in a significant manner to influence the subject's pronoun, and demonstrate how address patterns are associated with age groups. The middle subject age groups from Tables 1 and 2, which were given both pronouns by the interviewers, are particularly clear examples of this interaction, inasmuch as they illustrate strong patterns of variation with regards to both the interviewers' age, as well as to the pronoun which they offered to the subjects.

As a whole, I believe the results from Alicante show the importance of considering the linguistic as part of the social, as well as the significance of linguistic deference: certain social categories which are not necessarily more powerful than others receive more deferential address than other categories, giving rise to non-reciprocal T/V address. Moreover, this non-reciprocity can occur in spite of personal feelings between the interlocutors and, as we have seen, can also be oblivious to objective power relationships and socioeconomic status differentials.

Conclusion

In conclusion, this paper has provided new theoretical and methodological directions for the study of T/V pronouns and, in particular, T/V non-reciprocity. In addition, a study which implemented these concepts was detailed, providing confirmation of their applicability to empirical data collection. Although further refinement of my views and analysis of more varied dyadic situations in diverse communities are certainly needed, I believe that the ideas advanced in this paper are valid ones, and also shed new light on a time-worn sociolinguistic topic. It is my hope that the innovations presented herein will be an impetus to renewed interest in T/V pronouns.

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Prototype Theory in Language and Cognition

Patricia Escarraz

Introduction

Although prototype theory began as an explanation of the relational representation of lexical items and their attributes, i.e. as a theory of semantics, it has proved useful in many other domains of linguistic analysis as well. Indeed, it is my intention to show in this paper how prototype theory, in a diversity of forms, can be applied to virtually all domains of linguistic analysis, rendering itself a kind of linguistic metatheory. In order to see prototype theory as having such a broad scope it is necessary to assume an interactivist position. That is, prototype theory is widely applicable because it posits the notion that linguistic structure and other general cognitive structure follow the same principles of organization.

In illustrating this prototype metatheory, I will start by contrasting the original conception of prototype theory with its predecessors in the field of semantics, and discussing the predictions the theory would make for psycholinguistic research. I will then move to applications of prototype theory in domains of linguistic analysis other than semantics, outlining a specific example of a prototype theory of syntactic categories. I will also include a discussion of how the concepts of schema and script relate to the notion of prototype and how these theoretical constructs provide a complete and powerful tool for the task of explaining the representation of meaning in the human mind.

Origination of Prototype Theory

Prototype theory was first advanced in its most useful and sophisticated form by Eleanor Rosch in 1975. The theory came into being as a counter-explanation of the organization of lexical items to the then popular semantic network models and semantic feature models. Though the prototype theory of semantics had much in common with the two semantic models of the time, it proved to be a more complete theory of the categorization of lexical items and the relations between them.

The semantic network model, presented by Collins and Quillian in 1969, proposed relations between lexical items, but did not explain how specific features of lexical items fit into these relationships. In this model of semantics it was proposed that lexical items which obviously have some semantic relation to each other are represented in the mind in a network structure. Words that have some semantic connection to each other, for instance, 'canary' and 'robin,' would theoretically be represented in the network structure somewhat close to each other and one of these words would 'activate' a semantic 'pathway' to the other. The major objections to this theory are that while it did represent relations between semantically related words, it did not specify why those relations exist or how and why some sets of words may be more closely related than other sets.

The semantic feature model, proposed by Smith, Shoben, and Pips, 1974, did more than the network model to explain why some sets of words are more closely related than others. In the feature model, Smith et. al. suggested that each lexical item is represented by two lists of attributes. In one list were all the features characteristic of the item and in another were all the

defining features of the item. These two checklists would supposedly explain two levels of relatedness between associated word sets. What the theory did not explain, however, was just how large a set of associated lexical items might be represented in the mind.

Rosch and Mervis' (1976) prototype theory, in contrast to the other two semantic models, accounted for both dimensions of lexical organization by suggesting the existence of fuzzy boundaries between lexical items based on the attributes (or features) those items share, or, 'family resemblance' between related items. In a paper entitled "Family Resemblances: Studies in the Internal Structure of Categories," Rosch and Mervis show, through a series of experiments, that family resemblance of items in a category is a major factor of prototype formation. Family resemblance is also shown to be more indicative of category membership than criterial attributes (of the semantic features model). In another paper in 1976, Rosch et. al. show that prototypes form in 'basic categories' where items in those categories have the largest number of attributes in common and a minimum of attributes in common with items of contrasting categories.

In the field of psycholinguistics it is assumed a semantic model should not only explain the representation and the relationships of lexical items in the mind, but also it should explain the occurrence of 'priming effects' in lexical access studies. A complete and powerful theory of semantics should make predictions consistent with the evidence from studies on lexical access which find priming effects in both lexical decision and naming tasks. The theory should do this, as well, with the smallest set of theoretical concepts necessary. Prototype theory does, in fact, suggest a minimum number of constructs, namely, that lexical items group in 'basic categories,' the members of which share 'family resemblances' and that a prototypical member of a category will have the most attributes in common with other members of that category and the least with members of other categories. With these constructs, Rosch and Mervis' theory, consistent with the evidence, predicts that semantic priming will occur in lexical access studies involving lexical decision and naming tasks. Furthermore, a study by Rosch (1975) showed that priming effects are stronger when the prime is a prototypical member of a category rather than simply another member of the category of the test stimulus.

Prototype Metatheory

As suggested in the introduction, prototype theory has a broad scope of application because it proposes that the organization of meaning in the human mind follows the same sorts of principles whether in the domain of lexical semantics or any other cognitive set of meanings. D. Geerearts, in an article entitled, "Prospects and problems of prototype theory," refers to examples of extensions of prototype theory to phonology, morphology, syntax, historical linguistics, markedness theory, and theoretical lexicography in support of his statement that "the development of prototype theory into cognitive linguistics contains exciting promises of a unified theory of linguistic categorization." In Geerearts' paper the discussion of a 'unified theory' is prefaced by the generally accepted mandate that linguistic theories provide explanatory depth as well as descriptive adequacy and productivity. In the following section of the present paper I will sketch a very simplified version of an example of prototype theory in the domain of syntax in order to show that the 'unified theory' of which Geerearts speaks is precisely the linguistic metatheory mentioned in the introduction to this paper and that it does provide the explanatory depth as well as the descriptive adequacy and productivity necessary for deserving this label.

Prototypes in Syntax

One extension of prototype theory to a domain of linguistic analysis other than semantics is William Croft's functionalist syntactic theory outlined in *Syntactic Categories and Grammatical Relations*. As the name of his book implies, his theory is based on two dimensions of linguistic analysis: categories and relations; both of which are defined in terms of prototypicality. Croft's theory involves many more concepts not relevant to the present discussion, but the basis of this grammatical theory rests on prototypical notions of semantic classes of lexical roots and of the pragmatic function the root performs.

The first dimension of Croft's analysis distinguishes between three major classes of lexical items; nouns, verbs, and adjectives. In this distinction all three categories are said to be prototypical classes, though adjective are a less prototypical class than nouns and verbs. Croft cites Rosch (1978) saying, "prototypes tend to contrast maximally in their defining properties..." as explanation for why adjectives are less prototypical than nouns and verbs. As is clear from Table below (from Croft 1991:132), adjectives have some features in common with nouns and some with verbs; they have one unique feature of gradability. Nouns and verbs, however, contrast maximally.

TABLE 1-SOME CHARACTERISTICS OF SYNTACTIC CATEGORIES

	(nouns) OBJECTS	(adjectives) PROPERTIES	(verbs) ACTIONS
VALENCE	zero	nonzero	nonzero
STATIVITY	stative	stative	processual
PERSISTENCE	persistent	persistent	transitory
GRADABILITY	nongradable	gradable	nongradable

In addition to establishing the three major semantic classes of lexical roots, Croft proposes the idea that prototypical members of prototypical classes correspond to particular functions in language use. In other words, a lexical root which is a prototypical member of the class adjective, like 'white,' will function in modification. A prototypical noun will function in reference, and a prototypical verb, such as 'hit,' will function in predication. This is to explain that even though a noun like 'motion' may denote action just as does the verb 'move,' the noun form is marked with function-indicating morphosyntax, and its lexical root is, in fact, the prototypical verb form, 'move.' This second dimension of Croft's theory yields Table 2, which outlines types of members from the prototypical syntactic categories (in italics), along with some non-prototypical correlations, classified by their corresponding discourse functions and their semantic class (1991:67).

TABLE 2-CLASSIFICATION OF SYNTACTIC CATEGORIES, BY FUNCTION AND SEMANTIC CLASS

	REFERENCE	MODIFICATION	PREDICATION
OBJECTS	*unmarked nouns*	genitives, adjectivalizations	predicate nominals
PROPERTIES	deadjectival nouns	*unmarked adjectives*	predicate adjectives
ACTIONS	action nominals, complements, infintives, gerunds	participals, relative clauses	*unmarked verbs*

Prototypes in Cognition

Beyond the scope of linguistics, prototype theory has played a significant part in the study of cognition. In fact, before the split between linguistics, psychology, and anthropology became hard and fast, Bartlett (1932), an anthropologist, introduced the idea that people organize stories according to 'basic organizing principles,' or 'schemata,' which suspiciously resemble story prototypes. Thus in telling and reading stories, people use knowledge of what a prototypical story in their culture should include. A computer scientist, Roger Schank, adding to the body of work utilizing the notion of prototypes, suggested that people also have episodic knowledge of prototypical event structure, which he called scripts. Both these concepts, it is maintained, are culturally specific. In other words, people establish cognitive prototypes to use as knowledge of how things occur in their culture.

Though there is still division between linguistics, psychology, and anthropology, several researchers in these fields continue to search for agreement on the role of prototypes in cognition. In a book called *Cultural Models in Language and Thought*, editors Dorothy Holland and Naomi Quinn integrate the authors' intentions saying, "Collectively, the authors argue that cultural knowledge is organized in "cultural models" --story-like chains of prototypical events that unfold in simplified worlds. . ." This concept of 'cultural models' seems to be an expansion of the notion of a script and also closely related to that of schema. Cultural models, it could be said, are made up of scripts linked together to form a larger script. One example of a cultural model explored in *Cultural Models* is George Lakoff's paper, "The cognitive model of anger inherent in American English." In this piece Lakoff outlines a cultural model of anger based on the physiological effects of anger and its prototypically cooccurring participants and events, and shows how, through metaphor and metonymy, American English displays adherence to the cultural model of this cognitively complex state. In other words, idioms like 'hot under the collar' and 'she flipped her lid' are not random expressions of an unanalyzable emotion, but are systematically related through prototypical cognitive representations (metaphor and metonymy) of physiological relationships in the world. "ANGER IS HEAT." hence, 'hot under the collar' and "WHEN ANGER BECOMES TOO INTENSE, THE PERSON EXPLODES"--"WHEN A PERSON EXPLODES, PARTS OF HIM GO UP IN THE AIR," so 'she flipped her lid.'

Prototypes as Platonic Ideals?

Following the major point of this paper, namely that prototype theory is a useful tool in describing the organization of meaning in both linguistic and other cognitive domains, the question of the universality of prototypes must be addressed. If prototypes were to be thought of as like platonic ideals, prototype theorists would be suggesting that a prototype of a given category, for instance a prototypical chair in the category of all possible chairs, is the one ideal mental representative of the category of chairs for all human beings. This is not, however, the argument that is made by prototype theorists across the board. Several studies (Kay 1976, Kay and McDaniel 1978) utilizing prototype theory in the investigation of the meanings, and 'linguistic significance' of basic color terms have concluded that there are universal prototypical representatives of 'basic' colors. Also suggested in this body of work, though, is the idea that the prototypes of those colors may change over time, as the culture, and consequently the language, incorporates new color terms. Although many of the researchers involved in these studies conclude that universal evolutionary processes are at work in defining color terms differently at different point in time within a given culture, it would be premature to suggest that all prototypes are universal. It may be much more useful, in fact, to allow prototypes from distinct cultures to tell us something about how cultures differ from each other in their representations of meaning. In other words, the use of prototypes in cognitively constructing relations between meaning may be seen as a cognitive universal, while the particular prototypes adhered to in any given culture, or subculture for that matter, may differ widely from those of other cultures.

Conclusion

Assuming an interactivist position, from which it can be said that linguistic knowledge and episodic, or other general cognitive knowledge are organized by the same principles, prototype theory clearly stands up to the task of explaining cognitive structure. In the field of semantics, prototype theory was first advanced by Rosch and Mervis (1975) in order to explain relationships between lexical items based on their shared attributes, or "family resemblance." The utility of prototype theory did not begin and end in the field of semantics, however. It began, in fact, with the notion of schema, or basic (prototypical) organizing principles, proposed by Bartlett in 1932. Yet today the theory gains proponents putting it to use in a wide variety of fields, cognitive and linguistic. In this paper, by discussing several areas of analysis in which prototype theory has proven useful, I have begun to develop a kind of prototype metatheory. It is yet to be seen whether or not linguists, psychologists, and anthropologists can follow the mandate of such a metatheory in integrating their fields of study to produce the comprehensive model of human cognition the theory implies.

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Sociolinguistic Competence in Context: The Formality Factor

Robin Dale Zuskin

The task of assessing a second language learner's sociocultural competency is extraordinarily complex. This component of communicative proficiency entails many "fuzzy" variables which need to be explored before an evaluation tool can be developed. Formality has surfaced as one of these factors, with the degree of politeness and directness entangled in its scope. At times these factors may appear identical, particularly politeness and formality, but I do not believe this is the case. Accordingly, a formal code of speech may not necessarily insinuate attention to politeness norms (e.g., one can appear impolite while using a formal register or quite polite with an informal one). Blum-Kulka (1990) argues, for example, that social situations and their related "frames" ('a la Goffman 1967,1974) are in fact responsible for those politeness values we come to rely on in deciding upon our appropriate course of speech action.

This social encoding varies from culture to culture since the level of intimacy and symmetry (or asymmetry) of the role and power relationships among family members greatly accounts for the degree of directness. But the point remains that formality appears to affect constituents' choices of which politeness strategies to use in a given situation. It is very easy to understand how politeness and formality variables have been mistakenly viewed as synonyms.

Blum-Kulka, one of the few researchers to call attention to the issue of formality, is trying to explain the politeness phenomenon. She admits that their delicate relationship stems from social expectations, on the one hand, and cultural ones on the other hand. But the contextual, situational constraints seem to correspond to both of these variables so that a complex triad emerges.

The notion that there exists a set of culturally-specific sociolinguistic rules which govern norms of behavior (Ervin-Tripp, 1971; Lakoff, 1975) presents a challenge for second language learners. While second language teachers have begun to make these face-saving aspects of speech more explicit to non-native speakers, very little emphasis has been placed on the situation specificity of determining an utterance as "appropriate." It is this undersensitivity to contextual constraints which needs to be conveyed to students. And since the effectiveness of teaching strategies demands evaluation, any measurement tool which includes a sociocultural construct must also be found on authentic native-speaker reactions to a mismatch of situation registers.

Sociocultural Competence

A number of studies on speech acts from apologizing to requesting to complimenting have demonstrated that despite their strong command of grammar and lexicon, many non-native speakers may lack the ability to effectively communicate in a given situation (Wolfson, 1981, 1989; Thomas, 1983; Rintell, 1981; Scarcella, 1983). The largest study of this type concerns the Cross Cultural Speech Act Realization Project (CCSARP) (Blum-Kulka et al, 1989) which is currently investigating sociocultural constraints across a number of different languages and cultures. In addition to establishing native speaker and non-native speaker norms of apologizing and requesting behaviors in various contexts, this research team hopes to examine interlanguage variation as well as cross-cultural, universal patterns.

These studies have contributed a great deal to our understanding of the reasons underlying second language learners' inappropriate sociolinguistic behavior; their responses have often been misinterpreted by native speakers (NSs). However, little research has focused on native speaker reactions to these violations. Instead, the general efforts have been toward collecting samples of non-native speakers' (NNSs) inappropriate utterances of NS norms against which the former should be judged. In response to this void, I have decided to probe native speakers for their attitudinal reactions to NNSs nonconformity to expected rules and standards.

The objective of this study is to see how NNSs' strict adherence to the "**informal prohibition rule**" (Janicki, 1985)-- the overgeneralization and overapplication of the formal speech code to both informal and formal situations--affects NSs of English. This study will serve as a pilot for designing a research project which will include a quantitative component of analysis as well as a much larger pool of subjects. The value of employing a qualitative analysis of NNSs' emotional reactions in the future will also be determined by this preliminary study.

Through this project, the following hypothesis will be tested: that NSs perceive NNSs' overreliance on the formal register (regardless of the formality of the situation at hand) as more acceptable in terms of politeness and appropriateness than if NNSs were to use a predominantly informal code in situations mandating formal communication strategies.

Methodology

Subjects

Ten adult native speakers of English (5 females and 5 males) whose ethnocultural background is primarily Anglo-American. The subject population was selected from graduate students (age 22-40) at the University of New Mexico, most of whom are studying history or science-related disciplines. The lack of random selection and small size of the subject pool were admittedly conspicuous weaknesses of this design.

Data Collection Procedures

The elicitation of native-speaker judgements was accomplished with pre-recorded dialogues between a native and non-native speaker. This format has proven to be popular among researchers and relatively dependable. Two unique variations have been added to this procedure: 1) a Likert or Summated Rating Scale[1] which is meant to simulate politeness and appropriateness continuums; and 2) 4 emotional descriptors that attempt to characterize the native speaker responses and which Janicki (1985) strongly recommends.

Specifically, 8 scripted conversations between a NS and NNS were performed and tape recorded: Two in an informal scenario (e.g., a student party, McDonald's) where the NNS adheres to the formal code; Two in an informal scenario where the NNS employs the informal register; two in a formal scenario (e.g., a bank, a professor's/employer's office) where the NNS uses informal speech; and two in a formal scenario where the NNS maintains the formal speech code.

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[1]A type of attitudinal scaling technique which contains a set of approximately equal items in terms of attitude or value loading. The subject selects from the scale's varying degrees of intensity ranging between two extremes such as agree-disagree, accept-reject, easy-difficult, etc. This type of scale is widely used for teacher and course evaluations. This technique has been adapted from the Semantic Differential model (Isaac and Michael, 1989).

Subjects were asked to rate NNS deviant communication strategies along three dimensions: 1) **appropriateness continuum** (scale of 1-7, with 1 being very inappropriate and 7 being very appropriate); 2) **politeness continuum** (scale 1-7, with 1 being very impolite and 7 being very polite); and 3) their **emotional reaction** to that NNS: IRRITATION (negative feelings from uneasiness to annoyance), AMUSEMENT (NS laughs or smiles). APPRECIATION (e.g., feelings of contentment, admiration or other positive feelings evoked in NS), of ACCEPTANCE (no emotional reaction). *The results from subjects' emotional reactions are not included in this brief report.*

Results & Analysis

		CODE	
		+FORMAL	-FORMAL
SITUATION	+FORMAL	5.75	3.29
	-FORMAL	6.70	6.33

Table 1. Mean of Politeness Ratings (1-7)
Across-Subjects, Across Dialogues

The hypothesis that an overly informal code is construed as less polite than an overly formal code seems to be supported by the data collected in this experiment. In fact, deviation from the expected register is approximately two times less polite when the request was excessively informal as opposed to formal. Native speakers appeared to agree more on the underuse of formality codification than its overuse; in other words, the data generated by this included a more limited range of numbers on the scale 1-7 with no excessively high or low scale ratings recorded. NSs appeared to arrive at a consensus more easily regarding what constitutes impolite rather than polite sociolinguistic behavior.

		CODE	
		+FORMAL	-FORMAL
SITUATION	+FORMAL	5.87	3.00
	-FORMAL	5.54	6.20

Table 2. Mean of Appropriateness Ratings (1-7)
Across-Subjects, Across Dialogues

In terms of whether overly polite or insufficiently polite behavior was appropriate to the perceived context, native speakers were quite clear on what were unacceptable request forms but had more trouble with the cut off point of that acceptability level. Thus in Table 2, the ranking of appropriateness for informal requests made in what was perceived as formal situations was rated much lower than when register and situation are reversed (almost half-3.0 vs 5.5). Once again, we find further support for the hypothesis stipulated in this paper.

Moreover, the perception of formal contextual constraints seems more keen than those associated with informal scenarios. NSs, in general, appear to be more certain or clear as to what constitutes violation of non-casual sociocultural rules than casual ones. This can be explained by the more specific nature of defining taboos in a society over explaining what is in fact acceptable behavior--more attention is given to indoctrinating speech community members on the DONT'S vs. the DO'S.

Finally, the close parallel between NSs' awareness of politeness and appropriateness norms deserves comment. The major source of difference between the two (not to say I'm claiming "significant" difference since I have not applied statistical procedures to this analysis) seems to lie in the -FORMAL situation, +FORMAL code combination. Here NSs judged appropriateness differently than politeness. They demonstrated sensitivity to the excessive politeness forms of the nonnatives almost uniformly but differed in their perceptions of whether that excessiveness was appropriate to the situation or not; variability among the NS raters was a salient feature of this study.

Conclusions

This pilot study has demonstrated that formality **does** play a role in determining the politeness and appropriateness of speech. It also offered evidence toward the notion that such expected norms of behavior are grounded in culturally-specific knowledge. Native speakers appear, however, more clear on what defines formal speech norms versus informal norms. Voeglin (1960) explains this phenomena in terms of "evaluational consensus." He argues that formal speech has available to it more litmus tests or criteria with which to define appropriate behavior and violations of that behavior. This is due to the fact that there is little disagreement about what constitutes non-casual speech, while a greater diversity of opinion in evaluating casual speech can be expected.

Future studies associating formality, politeness and even directness are highly recommended. Possibly an exploration of gender variation with regards to register would also shed some light on the face-to-face interaction norms which appear to be on the cutting edge of the sociolinguistic research forum. By recognizing that sex identification carries with it sociocultural baggage, we stand to interpret sociolinguistic data with greater accuracy. Finally, in terms of the emotional responses produced by the NSs in this preliminary study, it seems that a qualitative review of such data should prove valuable; however, to attempt to quantify them would defeat their utility entirely. This combination of qualitative and quantitative analyses is gradually becoming more and more acceptable in L2 research--a logical outcome reflecting the field's need to improve research methods.

In spite of the high interest this topic has generated over the past decade, the formality/informality dichotomy has bee somehow overlooked. It may very well be due to a belief that formality is a subcategory of politeness and that the reverse is not possible. It seems to me that when variables such as status and role receive credit for influencing politeness and indirectness behavior, their appearance in the definition of formality is no slight coincidence. We stand to learn a great deal about sociocultural competence--and communicative competence in general--by investigating this socially significant dichotomy. I believe that Janicki may be right in her analysis of the problem: that we have arrived at a free-for-all of terms. The careless cross-application of politeness and formality has prevented researchers from looking at formality as a distant, although not inseparable, factor.

APPENDIX

Native Speaker Appropriateness/ Politeness Questionnaire
(instructions plus sample of dialogue #1 only)

Instructions: you will hear 8 different tape-recorded conversations between an American native speaker of English and a foreign-born person whose first language is NOT English. Each dialogue will be played twice. For each one, you will be asked to put yourself into the role of the native speaker and judge the non-native speaker's utterances on a scale of 1-7 in terms of degree of appropriateness and degree of politeness. The scales you are to use for ranking are illustrated below:

Very Inappropriate----------Very Appropriate
1 2 3 4 5 6 7

Very Impolite----------Very Polite
1 2 3 4 5 6 7

Finally, you will be asked to give your emotional reaction, as a native speaker of English, in reference to the non-native speaker's utterance. You can chose from these four response indicators:

IRRITATION (negative feelings ranging from uneasiness to annoyance)

AMUSEMENT (You are made to laugh or smile)

APPRECIATION (The utterance evokes feelings of contentment, admiration or other positive feelings)

ACCEPTANCE (no emotional reaction)

Note: Your honest, initial reaction is crucial to the validity of this study. Please do not respond according to what you think you are expected to say. No one is judging your reactions.

Dialogue #1

Appropriateness of non-native speaker's utterance: _____ (on a scale of 1-7)

Politeness of non-native speaker's utterance: _____ (on a scale of 1-7)

Emotional reaction descriptor word: Irritation--Amusement--Appreciation--Acceptance
(circle one)

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Male/Female Speech Patterns: Singularity versus Diversity

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In an effort to understand differences in male/female speech in concrete, measurable terms, I have turned to acoustical and phonetic literature. However, it soon becomes clear that even a fairly comprehensive understanding of the physiology of speech and perception is inadequate to explain the phenomena observable in gender differentiation. As the early sociolinguists discovered in reaction to the abstract nature of Chomskyan linguistics, language cannot be understood outside of the social context in which it is used. Similarly, even the most rigorously scientific researchers now concede that social and cultural factors partially account for the discrepancies found between the understanding of the physiology of speech and the ways in which it is produced.

The classic study of vowels conducted by Peterson and Barney (1952) first established statistical methods for measuring two formant frequencies (F1 and F2) of ten English vowels. They set out to understand the incongruities that often occur between intended utterance and that which is identified. The authors tested the speech of men, women, and children and found that sounds were produced and perceived on a continuum with much overlap and variability within individual speakers (although with more variability across speakers), and that this distribution was not random, but systematic according to each subject and each group. It was noted that higher frequencies mad the task of measuring formant frequencies much more difficult, thus explaining the apparent neglect of females and children in acoustical studies. It was also noted that there was more variability within female formant patterns than in those of either men or children. Indeed, one graph illustrated that formant patterns of men and children have fairly homogeneous groupings at opposite ends of the spectrum. Peterson and Barney did not have an explanation for the wider distribution in female formant patterns but they did explain the problem of intended versus identified utterance as being related to the speaker/hearer's previous experience. Specifically, speakers who did not clearly distinguish between low vowels in their own speech also failed to classify these sounds as distinctive in the speech of others. Similarly, a speaker who substituted one sound for another systematically made this substitution in the speech of others. These two findings laid the groundwork for other researchers; indeed, this study remains relevant forty years later.

Given that there are acoustically measurable differences in the speech of males and females as demonstrated in the Peterson and Barney experiment, we now must ask: What are the cues and strategies which listeners adopt for gender identification? Coleman (1976) extracted two voice qualities: Fo (fundamental frequency) and VTR (vocal tract resonance), and constructed two experiments to test the possible predominance of one over the other as a gender identification strategy. It is noted that previous experiments found that gender differences were still accurately perceived when fundamental frequency was removed, as in whispered phonation and voiceless segments. Nevertheless, this dimension is apparently still the most consistent and salient cue in gender differentiation. Coleman's hypothesis is that gender identification may be a result of combined acoustic cues, specifically Fo and VTR. The hypothesis was corroborated in that, when produced simultaneously, these two cues produced overwhelmingly correct results. However, in another experiment in which the cues were deliberately mixed across genders: i.e Fo from a male voice was presented simultaneously with VTR from a female voice and vice-versa, the results

were ambiguous. It should be noted that, in this experiment, Fo was artificially provided by a laryngeal vibrator according to standard levels of male/female production. Coleman concedes that this may skew the data due to the difficulty of artificially reproducing female Fo (a problem that continues to plague voice synthesis research). Despite this glitch, results in the experiment demonstrated an overwhelmingly higher rate of "maleness" identification. More women were identified as male when the male Fo was presented together with female VTR, though men were still mostly identified correctly when the cues presented were female Fo and male VTR. Coleman attributes the predominance of male perceptual cues in this experiment to three factors: (1) the artificial source of frequency already discussed; (2) possible differences in glottal source in which females use dimensions other than pitch; and (3) bias of the listeners in which females consistently used low Fo as a male marker (women used this cue 80% of the time as opposed to men only 45% of the time).

The aforementioned experiments basically support the hypothesis that fundamental frequency is still the most salient and consistent cue in gender identification, though more so for maleness. These results are perhaps not surprising considering the emerging evidence for the more complex production of the female voice, i.e. glottal source variation other than Fo.

Other researchers have attempted to find how many acoustic parameters are required for gender identification and the relative salience between them. Murry and Singh (1980) chose five dimensions: pitch, hoarseness, breathiness, nasality, and effort. They concluded that the most consistent cue across gender was Fo; although for females this may be secondary to other complex qualities. Their conclusion seems to be supported by the finding that lengthening of the stimulus from single vowel to phrase provided necessary additional information when judging female speakers (the vowel was sufficient to identify male speakers). Cues depended both on sex and the sample, and they did not find any common set of parameters--apart from Fo--that could be used consistently across gender lines. Again, the implication of such a finding is that the production and perception of female speech is more complex than acoustic measurements can adequately describe and that cultural and social factors may be involved.

Research in voice synthesis has led to studies which attempt to uncover the apparent anomalies in female speech production and perception. Childers and Wu (1991) conducted a partial replication of the Peterson and Barney study. The former researchers confirmed the greater variability in female formant patterns (although they found some different values for formant frequencies), and also found that this variability may be due to glottal activity rather than vocal tract shapes. Childers and Wu also confirmed that both Fo and VTR improved gender recognition (as found in Coleman 1976). Additionally, Childers and Wu found that by further breaking down the acoustic information, better results could be obtained for gender recognition. For example, Fo provided 100% efficiency in identifying males, but F2 was equally effective (100%) in identifying females. Thus their attempts to uncover one crucial recognition variable were defeated in the face of the realization that no one dimension was sufficient for this task. Formant values and Fo overlapped to provide redundancy in gender information, but Fo alone was insufficient.

If female voice production is more complex than male, the question arises: In what way and why? Henton and Bladon (1985) investigated the use of phonation types in English, specifically, the quality of breathiness. The authors note that this characteristic is not used distinctively in English as it is in some other languages, and though it may be symptomatic of some pathological condition, Henton and Bladon posit the suggestion that breathiness in English may be a marker of female speech. They set out to find the acoustic correlates of breathiness by examining Gujarati, in which breathy voice is employed contrastively. Through comparison of

English and Gujarati, Henton and Bladon established (by measuring the elevation of the first harmonic) that English-speaking females were producing as much breathiness as that of Gujarati speakers, even though the latter use it distinctively. Two different dialects of English (RP and a Northern British dialect) were sampled to eliminate dialect-specific uniqueness; still, breathiness was found to be equally present in both English varieties.

It is understood in phonetic terms that breathiness is a less efficient method for phonation since, by definition, it permits leakage of sub-glottal air pressure form incomplete adduction of the vocal folds. Breathiness is also known to decrease intelligibility since, again, by definition, a sound is being produced against a background of noise, i.e. escaping air. Finally, incomplete adduction implies a lack of longitudinal tension in the vocal folds, thus lowering the pitch. Therefore, a breathy voice implies restrictions on pitch movement as well as intensity, thus limiting overall variability and color in delivery. Interestingly, these two qualities--variability and color--are usually cited as characteristic of female speech; this apparent contradiction is not mentioned by Henton and Bladon. They do suggest, however, that women choose to use this voice type as a conscious or unconscious paralinguistic device to appear desirable. They claim that this manipulation can occur because of the possible effects on voice quality during arousal: secretion of lubricants bathes the larynx, making effective adduction more difficult, thus creating a voice quality similar to breathiness. By emulating this quality, women may be attempting to appear more desirable. Of course, we are all aware of the exploitation of this vocal quality in many TV and radio commercials (in the USA, at least), in which women are directed to exaggerate this phonation type in order to enhance a certain stereotype. This raises the question of how much is choice, how much expectation? Is it possible that there is a Whorfian view of speech production?

Apart from the social and cultural implications raised by the Henton and Bladon paper, is the awareness that women are in fact adding other learned behavior to voice production which must be accounted for in any serious attempt at reproducing or recognizing female speech. Klatt and Klatt (1990) actually included the added dimension of breathiness in constructing a synthesizer to reproduce female speech. They discovered in so doing that breathiness is signalled by a large number of diverse cues, and again found that no single cue was as effective as a combination of cues. It was also suggested that it may not be the case that listeners employ different strategies for identification, but rather that the manipulation of single cues produces perceptual ambiguity; that is, listeners hear differently instead of choosing an interpretive strategy.

Most significant in the Klatt and Klatt paper was the fact that breathiness was accepted as a "natural" dimension of female speech in English, and that by incorporating this characteristic, the synthesizer was much more successful at reproducing female speech. It can't be assumed that this a cross-linguistic trait, since we know that some languages use this phonation distinctively. Another study cited by Klatt and Klatt--Karlsson 1985--did not find breathiness in the vowels of female Swedish speakers. This evidence further supports the claim that acculturation and socialization are determinants in speech patterns.

The question then arises: If female speakers are incorporating more features into their vocal production, how much of this is innate (due to physiological differences) and how much is cultural? Sachs, Lieberman, and Erickson (1973) looked at this question from a phonetic viewpoint by studying pre-adolescent children ranging in age from 4-14 years. The authors noted that, up until this age, there is no physiological differentiation in oral tract or pharyngeal size. Thus, any perceived differences would be the result of speakers choosing certain strategies to

distinguish their speech styles. For example, pitch is the most obvious and consistent marker between adult males and females, partly due to the enlargement of the male larynx at puberty.[1] However, there is evidence from most acoustical and phonetic studies to suggest that physiological differences do not adequately account for the diverse patterns observed in male/female speech patterns. Reanalyses of the Peterson and Barney (1952) data attest to this finding (Childers and Wu 1991; Mattingly 1966); that is, men tend to talk "bigger" and women "smaller" than their relative sizes.

Sachs et al. (1973) set out to probe if the acquisition of gender characteristics occurred in pre-adolescence--before the occurrence of physical changes, and also to find out if formant frequencies figured in this differentiation (since Fo was virtually negated). They found support for both hypotheses. There was a high percentage of correct gender identity and formant frequencies were relevant to this discovery. Although, at these ages, boys have higher Fo than girls, during this experiment it was found that they consistently lowered their vowel formants. Girls, in contrast, demonstrated the mirror image in lower Fo and higher formants. Thus, although the lower formants were significant in identifying boys' speech, formant values were not highly significant in identifying girls' speech. Nonetheless, the overall pattern of high Fo, low formants, and low Fo, high formants were those characteristics documented as representing "boy-like" and "girl-like" speech, respectively.

Interestingly, two girls were consistently misidentified as boys: their formant patterns more closely resembled those produced by boys. Although they were not the tallest or heaviest (the children were paired according to height and weight to counteract physiological differences), their personalities were assessed as tomboys, athletic, tough, and competitive. The authors speculate that correlations between voice type and personality may be revealing; still, this is an area which has received little attention. I would argue that acculturation patterns are acquired early, become automated early, and thus very often cease to be transparent to the speaker's personality because the personality may develop beyond early imposed role-types with which the voice remains associated.

Sachs et al. also note that boys have a tendency to centralize vowels upon lowering their formants. This centralization is especially notable with /a/, which moves to a more schwa-like position. The implication from the Sachs et al. study is that although physiological differences are not yet effective because of physical immaturity, they are nonetheless relevant at this stage of development. The relevance of these differences stem from the observation that boys and girls appear to be experimenting with the physiological boundaries of their vocal apparatus and arriving at different ways of exploiting them. Indeed, this finding is consistent with the manner in which some researchers think that children learn articulation generally (cf. Papçun MS). For example, it would appear that in order to obtain lower formants despite an immature larynx, boys need to manipulate the vocal tract, making it longer to create deeper resonance. This can be done using the lips in more forward positions. Conversely, girls often speak with their lips spread, as in the smile, thus having the opposite effect of shortening the tract and diminishing resonance.

The distinct articulatory positions of boys and girls is reminiscent of a study by Ohala (1984), in which he presents the O-face (aggressive, assertive) versus the smile (child-like, dependent) as representing two different communicative strategies. This approach is meant to be

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[1] Ohala (1983) points out that it is not so much an enlargement, but rather a lowering of the male larynx at puberty, which then creates more resonating space for the male speaker.

an "ethological" perspective in which the expressions and accompanying styles are present in all living creatures, and signal largeness, power, dominance versus smallness, helplessness, and subordination. In another paper (1983), Ohala extends this idea to cross-linguistic use of pitch. He concludes that all language users exploit the "frequency code" in which high pitch is correlated with smallness and non-threatening behavior (produced with a smile or smile-like facial posture); and low pitch is correlated with largeness and threatening behavior (produced with O-face). Given the degree of variation we have seen among individual speakers, it is not clear that this view can be generalized to gender differences in speech. However, the implication are not easily dismissed when one considers the unconscious patternings and the manner in which acculturation occurs in speech behavior.

Spender (1980) notes that a study of deaf adolescents (without hearing from birth) shows an absence of voice change phenomena in their speech, implying that this rite of passage for male youths in our culture is indeed culturally determined. She also questions our culture's devaluation of high-pitched delivery, such as that of female broadcasters, and considers the option as to whether it is this inherent characteristic which is being devalued of the class of women itself. The problem becomes one of what is the norm and who is establishing it.

Following the lines of Sachs et al. (1973), Meditch (1975) acknowledges the claim that physical differences are only partial explanations and that gender-specific voice patterns are learned. Meditch's goal was to find out how early such patterns might be acquired. In a study reminiscent of Labov's (1989) investigation of the acquisition of linguistic variables in very young children, Meditch observes very young children (3-5 years of age) to test for differential speech patterns along gender divisions. Clearly, these children are even further removed from the influence of physiological differences than the children studied by Sachs et al. (1973), but that is Meditch's goal: to see if even younger children can be consistently identified along gender lines. Meditch found that there was still a high percentage of correct identification, though consistently higher for males than for females. In this case, the two oldest girls included in the study were often misidentified as boys; Meditch attributed this misidentification to physiological differences. In sum, what is of interest in Meditch's study is: (a) the early onset of the acculturation process; and (b) the hypothesized path of development for the divergent patterns which are already perceptible, despite the lack of physiological differences.

Meditch mentions three possible patterns of development to explain the apparent differences which seem to stem from the loss of features in boys' speech, and the subsequent gain of features in girls' speech. It seems that children begin with undifferentiated speech and, most likely, boys then begin to drop child-like features very early in their development. At this stage, girls' speech may remain unchanged, or suffer some loss of features before gradually attaining others. This addition of features apparently occurs after the boys' loss of features and appears in contradiction to the common wisdom which states that girls are precocious in language development when compared with boys. Perhaps this is only an apparent paradox, since the process of adding features implies layering of complexity. Meditch does not specify these features, except to note that they are markers of identity. The misidentification of the two oldest girls could be due to the fact that they have begun the process of losing undifferentiated speech (eventually attained by all speakers), but not yet begun the acquisition of added, gender-specific features.

Also of interest in Meditch's study was the differential behavior of respondents. Female respondents consistently identified both genders more accurately than male respondents, and were also more likely to guess male voices. An explanation for the ease with which boys were

identified is the assumption that they have undergone more change at this stage. There is no satisfactory explanation for why women are more acutely perceptive to voice identification, except that hearers may adopt strategies such as in-group and out-group criteria to process differences. If this is so, then women are accurately identifying the out-group. Why, then, does this not work in reverse?

Finally, in a study of Arabic emphatics, Kahn (1975) rejects physiological arguments for gender differences and sets out to demonstrate cultural patterns of behavior. First, she establishes the acoustic and phonetic correlates of Arabic emphatics and finds that they are pharyngeal. In addition, she discovers that, in vowels following an emphatic consonant, the first formant is raised and the second is lowered. Kahn then proceeds to attempt to uncover male and female patterns of emphatic use.

In the first study, Kahn used four native speakers (2 male, 2 female) of Cairene Arabic, who uttered strings of minimal pairs in which the emphatic consonant changed the meaning of the word: e.g. /ti:n/ "figs" -- /t.i:n/ "mud". Male speakers used much lower second formants than dictated by anatomical differences, thus departing further from a "neutral" position, and exaggerating differences inherent to female speech. On a subjective plane, informants were asked to cite any differences in the way which men and women speak. Responses noted that less pharyngealization sounded more feminine.

Because of the deficiencies of the small sample size in the first study, Kahn conducted a second experiment using a larger sample and a control group: three native speakers (1 male and 2 females) and seven American students (3 male and 4 female) who were studying Arabic as a foreign language with a male teacher. Interestingly, the results revealed that acoustical values, namely, F1 raising and F2 lowering, were significant differentiators of males and females. It was also found that Arabic women actually distinguish emphatics more than men (measured acoustically), a finding which contradicts anatomical differences and therefore suggests strong cultural influence. Kahn does not explain, however, if the lesser contrast in male speech was due to an overall greater degree of pharyngealization. In addition, it was conceded that in the second study only one Egyptian informant was used, therefore introducing dialectal differences. However, the fact that American female students of Arabic showed similar formant values to Arabic-speaking males would also rule out anatomical differences and support a theory of learned behavior.

Kahn's study was clever in excluding the acculturation factor by using foreign speakers, also in using a male teacher--thus learners are not picking up unconscious female gender patternings, which accounts for the results here of american women adopting the same formant patterns as Arabic males. It would be interesting to run a test in tandem with that of Kahn, using student informants studying with a female teacher. Kahn concludes with a caution that any phonetic effect such as emphatics should not be treated as standard phenomena, but rather is manipulated by speakers beyond physiological constraints to their own conscious or unconscious ends. The fact that Arabic women consistently showed higher formant values than American women also suggests culturally-determined behavior. It has been noted that this phenomenon occurs in some other languages such as Japanese in which it is expected that women speak with higher pitch.

A study similar to that of Kahn is Haeri (MS). Haeri associates palatalization in Cairene Arabic with general fronting processes in other languages and attempts to generalize this fronting tendency as a characteristic of female speech. She claims that palatalization is perceived as "feminine" and is a preferred form of production for the majority of women. However, there is

also evidence that this does not operate merely according to a sex-based, biological dichotomy, but also along gender lines. That is, some men use palatalization (or do not consciously avoid it), thus reminding us that sex differentiation, when removed from the strictly anatomical distinction, becomes more complex than the binary distinctions often imposed by social scientists.

Haeri's hypothesis might benefit from the addition of technical information about the phenomena under observation. For example, instead of only using impressionistic analyses, it would be beneficial to establish the acoustic and phonetic correlates of palatalization in order to measure the degree of secondary articulation being observed. These additional measurements would also be useful in establishing how much variation can be attributed to physiological influence and how much to other factors such as acculturation and socialization. Haeri's generalization that fronting tendencies are "feminine" and backing tendencies are "masculine" in some ways resembles Ohala's thesis on ethology; this correlation is perhaps worth further investigation, but with the realization that distinctions according to gender are more complex than superficially apparent (Haeri MS, Eckert 1987). It would also be appropriate to admit the caution against accepting one dimension (acoustic or phonetic) as constant, since it is used on a gradient scale diverging from physiological properties (Kahn 1975).

Conclusion

It appears from the literature surveyed in this paper that there exist further complexities in speech, apart from physiological differences, which distinguish male and female speech patterns. The apparent anomaly in Peterson and Barney's (1952) data in which female formant patterns displayed wider variability than either those of men or children can be explained by the adoption of learned behavior in which females employ other production techniques than Fo for differentiation, while Fo remains the single most salient marker of male speech. At least one variant in phonation type (breathy voice) for female speech other than Fo has been considered in the present paper, but it cannot be assumed to be a cross-linguistic variant, because it is used in some languages distinctively. It appears that differentiation in male/female speech is a cross-linguistic phemomenon, and that the phonation types that contribute to this differentiation are a product of acculturation--this provides a rich field for cross-linguistic and cross-cultural research.

Although males rely on Fo for identity, they exaggerate this dimension beyond the expected constraints of anatomy. The relative singularity and concentration of male production also explains why male speech is more consistently identified.

Male/female speech patterns defy simple explanation and cannot be contained within a strictly acoustical or phonetic framework. As in other language studies, male/female speech patterns cannot be abstracted from social and cultural factors.

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Supplementing the Binding Theory: On the Question of Proper Binding

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In this essay I want to propose that the phenomenon of proper binding is relevant to the theory of grammar and suggest that, if allowed to play a part in the writing of a generative grammar, proper binding can serve as an interface between the form of the grammar and its use in discourse pragmatics. With the term proper binding I refer to the prescriptive and descriptive statement requiring that anaphor and bound pronouns agree with their antecedents with respect to person, number, gender. In this vein, proper binding relates to the theory of grammar in the same way that government does. Like government, proper binding is the appropriation, on the part of generati e grammar, of a traditional term and phenomenon, in order to present it in a new light.

In its new role in the theory of grammar, proper binding provides a way to conjoin conditions A and B of the Binding Theory, turning them into a single statement. In particular, there will be no need to refer to the definition of the notion 'governing category.' The fact that the definition of the notion 'governing category' defines a domain that is syntactically equivalent to the domain of a clause (or a nominal) indicates that there is a duplication taking place to the extent that the use of these two terms refer to the same domain. Within the Government and Binding theory of grammar, such duplication is needed in order to make the clause into a complete functional complex; that is, the duplication allows every piece of information within a clause to play a role in the explanation of the way anaphors and pronominals behave (Chomsky, 1986). While recognizing the need for the duplication at the level of formal grammar, proper binding itself has no need for the duplication because, for its purposes, it is enough to refer to the categorical domain in which an element may be bound. In this respect, proper binding does not make descriptively explicit in any precise way the specific constituents needed to construct the notion of a governing category. It does not seek to account for obligatory co-reference and obligatory disjoint reference in the same way the Binding Theory does. What proper binding proposes instead is a supplementary statement that would, first of all, rule in as grammatical all constructions in which an anaphor or a bound pronominal agrees with its antecedent in terms of person, number, and gender. Secondly, it would designate as ungrammatical those constructions in which such agreement does not occur. And thirdly, it would, on the basis of generalized agreement, rule out as ungrammatical those cases that the Binding Theory rules out because of its theory-internal definition binding. To the extent that it can deal with all these cases following generalized agreement, proper binding is compatible with the Binding Theory. And further, because the notion of generalized agreement is a semantic notion, proper binding has a fairly direct link to discourse pragmatics. Thus proper binding seeks to stand between the pure form of the grammar and how that form may be used in co-operative discourse.

This paper has three sections, the first section is a short sketch of the BT as Howard Lasnik constructs it in his *A Course in GB Syntax* (1988). With this short exposition I am interested in showing how the strict requirement that the BT account for the form of the grammar leads to a definition of governing category that loses the intuition that anaphors are subject to

obligatory coreference and pronominals are not. The second section deals with the details of proper binding. The last section suggests ways in which proper binding may be used as a grammatical interface between syntax and discourse.

The Binding Theory

In chapter 2 of *A Course*, Lasnik presents the essentials of Binding Theory, doing so in terms of approximations. He goes through several approximations to conditions A and B or the Binding Theory before he presents the final product. In the course of this procedure he also defines the basic relations that will have much to say about how statements in the grammar are to be made. The relation of constituent-command relation, for instance, requires that in a configuration where a node C immediately dominates a node A and also dominates a node B, node A gets to define the c-commanding domain. This is prototypically exemplified with the subject constituent of a clause; the subject c-commands all the elements inside the predicate of a clause. The relation of binding is defined in terms of c-command and co-indexation: A binds B iff (i) A c-commands B and (ii) A and B are coindexed. What the BT seeks to accomplish through the use of indices, proper binding tries to accomplish through generalized agreement. This is an interesting difference between the two approaches addressed in section two. With respect to the final version of the BT, where the approximations state conditions A and B by making reference to a clause (or NP) as a binding domain, in the final version of the BT, reference to this domain via the clause is displaced in favor of the new expression 'governing category.'

(1) A. An ANAPHOR must be bound in its governing category (GC).
B. A PRONOUN must be free in its governing category (GC).

This new expression also receives a definition by approximations. The first approximation, for instance, defines GC in the following way:

(2) α is the GC for β iff α is the minimal NP or S containing β and a governor of β

In the final version of GC a more highly specified structure emerges, the definition making reference to every major constituent of the clause.

(3) The GC of α is the minimal NP or S containing α, a governor of α, and a SUBJECT accessible to α

In this definition, not only do we have a highly-specified domain, we also have a specialized reference to the SUBJECT, which, in capital letters signifies an AGR-subject and a lexical NP-subject. The specialized reference comes in the relation of accessibility, described thus:

(4) β is accessible to α if
a. β c-commands α, and
b. β is not co-indexed with any category containing α

The statement (4.b) is also known as the i-within-i filter. The final version of the BT requires the statement of (4.b) in order to account for constructions in which an ANAPH refers out of its tensed clause in violation of the Tensed-Sentence Condition, or TSC. The TSC prohibits any relation between X and Y in a configuration such as the following:

(5) ... X ...[α ... Y ...., where α = Tensed Clause

In this configuration, Y is an ANAPH and X an antecedent, but Y should not be able to pick up X as its antecedent because the morpheme Tense keeps Y from referring out of α. A clause like (6) below is lost to the TSC because it cannot account for its grammaticality and its failure to pattern after (7):

(6) The men think THAT picture of each other will be on sale.

(7) *The men think THAT each other are intelligent.

With (7), the TSC has no problems. The lower clause, being tensed, keeps the anaphor from referring out of that domain. The BT accounts not only for the behavior of the anaphor in (7) but also for the anaphor in (6), which behaves in contrast to (7). How (6) is ruled in as grammatical is the work of the i-within-i filter, (4.b) above. That filter allows the matrix clause subject to be the relevant (accessible) SUBJECT for the RECIPROCAL-*each other*. Let us apply the definition in (4) of accessible SUBJECT to the following structures (8), the embedded clause of (7):

(8) [THAT pictures of each other AGR-will be on sale]

AGR, as the inflected pronominal in the verb, while it appears as a potential SUBJECT-ß for a RECIP-α, does not qualify as accessible. In others words, if we were to put the index of ß on the category containing α, namely the NP-*pictures of each other*, we would create an i-within-i structure. The general effect of the i-within-i filter is to insure that the same index does not appear too often in a particular construction, effectively ruling out those constructions in which indices seem to 'bunch up.' In (8) above AGR must co-index with the NP-*pictures of each other*, thus making AGR inaccessible to the RECIP. Only the SUBJECTs of the matrix clause are accessible to the RECIP. As we can see, in this approach, for α to have an accessible SUBJECT-ß, α must be able to recognize its antecedent through the empirical filter of the i-within-i condition, submitting the potential SUBJECT-ß (the AGR of (8)) to an indexing test. By requiring this test, the grammar is simply using every formal element at its disposal in order to write the most constrained grammar possible. In such a grammar, the RECIP will not fail to get its antecedent; either it will find the GC in which it is bound or it will be free (unbound) in that same GC. In the second case, we can only expect ungrammaticality. Despite the deficiencies that surround the BT, there is a certain elegance that emerges when one follows how exactly an ANAPH escapes the Tense of the lower clause in which it finds itself and accesses a SUBJECT in the matrix clause. That chain of reasoning shows that the BT has a way to let anaphors in tensed embedded clauses refer to an antecedent found not in the lower, tensed clause but in the upper, containing clause.

As mentioned above, one problem that accompanies this version of the BT is the way in which the definition of GC reproduces exactly the domain of a clause. The problem here is not

so much that one has to mention two types of SUBJECTS, a lexical head, and the referential element under consideration as it is that the semantic intuition that the RECIP and the accessible SUBJECT of the matrix clause are obligatorily coreferential is made opaque by the pure form of the grammar. It is for this reason that I believe that the notion of proper binding is relevant to the BT. As a supplement to the BT, proper binding can easily take care of the straightforward cases of both obligatory coreference and obligatory disjoint reference. As for the more difficult cases, proper binding will not fail to interpret these, even in the absence of a fully worked out definition of GC. Let us turn to section two in order to see how proper binding is relevant to the BT.

Proper Binding as a Supplement to the Binding Theory

In a theory of grammar in which one does not need a fully worked out definition for the notion 'governing category,' proper binding will play the role of insuring that generalized agreement, as a bundle of formal elements in the grammar, does not get violated. In this respect, generalized agreement and the i-within-i condition have a similar function: as i-within-i gives empirical content to the definition of GC, so generalized agreement furnishes the descriptive features needed to account for an improper binding. In other words, as the i-within-i filter identifies cases of indexation that lead to ungrammaticality, so the relation of proper binding highlights those cases in which there is a mismatch between the features of a potential antecedent and the features of an anaphor or a bound pronominal. Since proper binding works in such close tandem with the i-within-i condition we might speculate if the latter is not an instance of the latter.

As a supplement to the BT, proper binding enters the grammar as a strategy for collapsing Conditions A and B into a single statement, which we might call the Proper Binding Statement (PB) and articulate as in (9):

(9) ANAPHS and PRONS are properly bound in γ, where
(i) γ = a minimal NP or S and (ii) no indexed element in γ violates the i-within i condition

One of the most immediate ways in which one can see the relevance of the proper binding statement to the BT comes in the form of the following data:

(10) a. *Himself likes John
b. *each other left
c. *the boys like herself
d. *the boys believe that Mary likes himself

To account for these data is no simple task for the BT. For (10.b) the BT needs to stipulate that a root clause is the GC for a governed element such as the RECIP (*Course*, p. 62). For the PB-statement, none of these cases is problematical. For (10.a) we simply say that there is impropriety of precedence. For (10.b) the reciprocal lacks a structurally represented antecedent to bind properly in its clause. Also, while (10.c) exhibits a mismatch of number and gender, (10.d) exhibits one of gender: *himself* does not agree with *Mary*. Further, if proper binding straightforwardly accounts for those cases in which a construction with indexed elements must

be ungrammatical because the featural structure between antecedent and anaphor do not match, it can also, obviously, account for those cases in which the indexing in a construction must yield a grammatical structure, and this thanks to the similarity of function between i-within-i and generalized agreement.

Paradigm (12) below is a prototypical set of data that allows the BT to speak in terms of the Tensed-S effect in (10.a) and the Specified Subject Condition effect (SSC) in (12.b-c). The BT rules out (12.a) as ungrammatical, calling it a Condition A violation. The SSC takes a structural formula much like the one for the TSC, except that the value of α differs, as (11) stipulates:

(11) ... X ...[α ... Y ...
where α contains a specified subject Z

(12.b-c) are hence SSC-effects because the specified subject Z NP-*Mary* lacks the obligatory coreference between antecedent and reflexive. For the BT, these also amount to condition A violations because the ANAPHS cannot, in any case, refer out of their tensed clause. Moreover, the BT designates (12.d) as ungrammatical, calling it a condition B violation: the pronominal is bound when it should be free.

(12) a. *John$_i$ believes that himself$_i$ likes Mary
b. *John$_i$ believes that Mary likes himself$_i$
c. *John$_i$ believes that Mary to like himself$_i$
d. *John$_i$ likes him$_i$

The proper binding statement has a way to rule out (12.a-c). It has little to say about (12.d) unless we force *him* to behave like an anaphor, which is what the indexing is forcing. To rule out (12.a-c), the PB-statement first assigns γ to the lower clause, and then requires the anaphor in that domain to match feature for feature with a potential antecedent. If it fails to do this, it is shown to be improperly bound. The RECIP ends its search for an ANTECEDENT. (10.d), as we have said, represents an ungrammatical case determined by the definition of Binding. In (10.d) the pronominal is properly bound in γ iff it is free in γ in the BT sense of free and bound. That is, in terms of the proper binding statement, we can simply say that a pronominal is proper in γ when it is free to refer and pick up and ANTEC, whether that ANTEC is structurally represented or not.

Consider a couple of cases that prove to have interesting explanations in terms of proper binding. The first has to do with the empty category PRO, the non-phonetic subject of infinitival clauses:

(13) It is important [PRO to understand the problem]

As far as the empty category in (13) is concerned, the PB-statement treats it as a pronoun that must be proper in γ, in this case the lower clause. In (13) PRO is free to refer and is thus proper in γ. Similarly, for a pair of clauses like (14.a,b).

(14) a. The boys$_i$ know how PRO$_i$ to behave themselves$_i$
b. They know how PRO$_i$ to behave oneself$_i$

The PB-statement will simply take it for granted that both PRO and the ANAPH search for a category in which each can be properly free and bound, respectively. In (14.a) for instance, the reflexive matches with PRO in terms of featural structure and thus PRO properly binds the reflexive. The reflexive is thus proper in its own γ. PRO is free in the γ of the reflexive but has its proper binding with the ANTEC NP-*the boys*. Thus, PRO too has its own γ. This type of data shows the further relevance of proper binding to the BT and its applicability to a non-phonetic category like PRO. In sum, it is an interesting fact that proper binding can account for the behavior of PRO.

Next consider how proper binding would analyze the Japanese reflexive system. Katada (1990) presents a three-way system by which Japanese reflexives may pick up a nearby ANTEC. The three reflexives are:

(15)	zibun	'self'
	zibun-zisin	'self-self'
	kare-zisin	'he-self'

Each of these reflexives, Katada points out, "displays contrastive binding behavior in a systematic fashion" (p. 288). Katada demonstrates this point with the following sentence:

(16) John-ga^{i} [Bill-ga^{j} Mike-ni^{k} { zibun?$^{i, j, *k}$ / zibun-zisin?$^{*i, j, *k}$ / kare-zisin?$^{*i, j, k}$ }
NOM NOM DAT
+no koto-o hanasita to] itta
ACC

'John said that Bill told Mike about self'

In this paradigm *zibun* may pick as its ANTEC, the lower or the higher clause NOM-Case NPs *John* or *bill*, but may not pick up the DAT-Case NP-*Mike*. By contrast, *zibun-zisin* may pick up only the lower clause NOM-Case NP. The DAT-Case NP is still not an option with these two reflexives. The third reflexive restricts itself to the lower clause and may pick up either the NOM- or DAT-Case NP. What this Japanese data suggests, along with the English cases in which an ANAPH refers out of a Tensed clause, is that the tendency is for ANAPHS to break out of so-called opaque domains. As such, what proper binding says about English reflexives applies to the Japanese reflexives as well. *Zibun* makes obligatory coreference with a subject constituent possible. Where *i* is the index, the coreference is bound to the higher clause subject. Stated in terms of proper binding, one can say that it makes the reference to that SUBJECT proper, in much the same way that in (7) and (8) above, the NP-*the men* is an accessible SUBJECT to the ANAPH-*each other*. Similar analyses can be given for the other two reflexives. But I will stop here, deferring discussion of the PB-statement's capacity to interface syntax and discourse, in order to give that topic a fuller treatment elsewhere.

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Some Considerations of the Use of Indices with Pronouns and *Wh*-traces

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In this paper, some of the consequences inherent in the practice of the use of indices to explain the reference of pronouns in the theory of government and binding will be addressed. I will attempt to show that some of the boundaries demanded by a theory of government and binding offer a rigidity which disallows some grammatical sentences in the English language. First I will examine current understandings of indexing as it is constrained by government and binding, and then I will propose a discourse level, pragmatic approach to indexing. I will use sentences from a situation which I have observed in current English usage to support my assertion.

Freidin and Lasnik (1981) offered the following explanation adopted from Chomsky's (1980) formalism for the assignment of indices.

> Every NP is assigned a *referential index*, consisting of a single integer i ($i \geq 1$). In addition, every nonanaphoric NP is assigned an *anaphoric index*, given as a set of integers which consists of the referential indices of all *c*-commanding NPs. An index (i, {j}) indicates that an NP whose referential index is i may not have the same intended referent as an NP whose referential index is j. The relation between the referential and anaphoric indices of an NP is that of disjoint reference (DR). Anaphors are not assigned anaphoric indices; only nonanaphoric NPs enter directly into the relation of DR (p. 40).

I will express obligatory disjoint reference by use of anaphoric indices in the following data which is taken out of context and thus considered only in terms of sentence level .

(1) $\text{Adam}_{(1)}$ thinks [$_s$. $\text{Erica}_{(2,\{1\})}$ loves $\text{him}_{(3,\{1,2\})}$]

(2) $\text{Adam}_{(1)}$ thinks [$_s$. that $\text{he}_{(2,\{1\})}$ loves $\text{Erica}_{(3,\{1,2\})}$]

It will also be necessary to introduce the principles of binding which are necessary for the relations of bound anaphora and disjoint reference. Freidin and Lasnik (1981) maintain that anaphors and pronouns are governed by the binding rules of Specified Subject Condition (SSC) and Propositional Island Condition (PIC) while *wh*-traces are not so governed. They suggest the following formulation of the PIC and the SSC.

(3) *NP_i, NP_i an anaphor, unless NP_i is bound in the domain of
(a) a subject (the SSC)
or (b) tense (the PIC).

The formulation in (3) can be accepted as a filter at the level of Logical Form (LF). That is, an NP and an NP which is an anaphor, cannot be co-indexed unless the NP is bound either (a) in the domain of subject (the SSC) or (b) in the domain of tense (the PIC). This is the standard paradigm of bound anaphora and includes reflexive pronouns, reciprocals, and NP-traces. The following data will illustrate.

(4) a. *lexical anaphors:*
i. *Adam$_1$ believed [$_s$. Erica to love himself$_1$]
ii. *Adam$_1$ believed [$_s$. that himself$_1$ loved Erica]
iii. Adam$_1$ believed [$_s$. himself$_1$ to love Erica]

b. *NP-trace:*
i. *Adam$_1$ was believed [$_s$. Erica to love e$_1$]
ii. *Adam$_1$ was believed [$_s$. (that) e$_1$ loved Erica]
iii. Adam$_1$ was believed [$_s$. e$_1$ to love Erica]

According to (3) above, the anaphors in the (i) examples are free in the domain of subject in the complement (subordinate) clause, so they are prohibited by the SSC. And, the anaphors in the (ii) examples are free in the domain of tense in the complement (subordinate) clause, so they are prohibited by the PIC. On the other hand, the anaphors in the (iii) examples fall within the domain of subject and tense in the main clause, so they are bound in the main clause and are not prohibited by (3).

Pronouns also fall within the domain of SSC and PIC, but there is a difference in that pronouns have the relevant property of obligatory disjoint reference while anaphors have the relevant property of obligatory coreference.

Indexing would explain that a pronoun is free with respect to an NP with the referential index *i* when the anaphoric index of the pronoun does not contain the integer *i*.

Again, a look at the data will illustrate:

(5) a. Adam believed Erica to love him.
b. Adam believed that he loved Erica.

The pronouns in (5 a,b) are free in reference to Adam. It is not clear if they refer to Adam or someone else. If we continue to follow Freidin and Lasnik's concept of indexing, then a pronoun whose anaphoric index does not contain the integer *i* is free in reference to an NP with a referential index *i*. Examples (6 a,b) will illustrate this.

(6) a. Adam$_{(1)}$ believed [$_s$. Erica$_{(2,\{1\})}$ to love him$_{(3\{2\})}$]
b. Adam$_{(1)}$ believed [$_s$. that he$_{(2)}$ loved Erica$_{(3,\{1,2\})}$]

In other words,

(7) A pronoun with referential *i* is *free* in a domain where there is no c-commanding NP with referential index *i* in that domain.

This is a formalized rule in Chomsky (1980) as explained in Freidin and Lasnik (1981).

(8) When a pronoun with anaphoric index j ($j = \{a_1,...,a_n\}$) is free (i) in the domain of subject or tense, $j \rightarrow j - \{i\}$.

But this rule (8) can result in an NP with a zero referential index, and it is assumed that such

index is ill-formed. That is, *$NP_{(0)}$. This is the reindexing rule, and it reads as follows:

(9) When an anaphor with referential index *i* is free(*i*) in the domain of subject or tense, $i \rightarrow 0$.

This is the system that Freidin and Lasnik (1981) used to show that a *wh*-trace has an anaphoric index which is not subject to the reindexing rules and is therefore distinct from an anaphor and a pronoun. I will look at the evidence involving coreference possibilities between a *wh*-trace and a *c*-commanding pronoun commencing with the current assertion in government and binding theory (Freidin and Lasnik (1981), Chomsky (1977), Postal (1971), Wasow (1972), Haegeman (1991)). The following paradigms will bring the problem to the fore.

(10) a. Who does he think Erica loves?
b. Who wants Erica to love him?
c. Who does he think loves Erica?
d. Who thinks he loves Erica?

In examples (b,d), the reference of the pronoun is free with respect to the variable bound by *who*. Also, the speaker may not need to know the referent of the pronoun in order to answer the question. The speaker may know the referent, however, as would be the case with a rhetorical question. On the other hand, in examples (a,c), according to Haegeman (1991), the referent of the pronoun *he* must be disjoint from the variable bound by *who* (crossover phenomena), and the speaker must already know the referent for these pronouns. I will argue against this claim below. The references can easily be examined when anaphoric index and predicate calculus are used.

(11) (for 10a):
a. $[_{s'}[_{c}\ who_3][_{s}\ does\ he_1\ think\ [_{s'}\ e_3[_{s}\ Erica_2\ loves\ e_3]]]]$
b. (for which X_3, X_3 a person) $[_{s}\ he_1\ thinks\ [_{s}\ Erica_2\ loves\ X_3]]$
c. (for which X_3, X_3 a person $[_{s}\ he_{(1}\ thinks\ [_{s}\ Erica_{(2\{1\})}\ loves\ X_{(3\{1,2\})}]]$

(12) (for 10b):
a. $[_{s'}[_{c}who_1][_{s}\ e_1\ thinks\ [_{s'}\ [_{s}\ Erica_2\ loves\ him_3]]]]$
b. (for which X_1, X_1 a person) $[_{s}\ X_1\ thinks\ [_{s}\ Erica_2\ loves\ him_3]]$
c. (for which X_1, X_1 a person) $[_{s}\ X_{(1)}\ thinks\ [_{s}\ Erica_{(2,\{1\})}\ loves\ him_{(3\{1,2\})}]]$

Examples (11b, 12b) simply replace a *wh*-phrase with its meaning. Examples (11c, 12c) have mapped the anaphoric indices onto examples (11b, 12b).

But first a look at current theory concerning *wh*-phrase movement and case assignment. Often in English abstract case is not morphologically realized leaving the *who/whom* distinction as one of the few surface structures remaining which indicate case. This distinction is rapidly grammaticalizing out of the language as well and is seldom made in spoken English. *Whom* does still occur in standard written English, although it is disappearing in other written English dialects. Although Haegeman (1991) argues that the trace of *wh*-movement is case-marked, I would adjust her statement to argue that in contemporary English, case marking is almost completely eradicated.

Lasnik (1988) defines the notion of Governing Category (GC) and its three conditions in the following manner.

(13) a. An anaphor must be bound in its governing category
b. A pronominal must be free in its governing category
c. A referring expression must be free.

The above are referred to as Condition A, Condition B and Condition C, respectively.

The following data will be used to illustrate the next section of this paper.

(14) $\text{Adam}_{(1)}$ thinks [that[$_s$· $\text{he}_{(1)}$ loves $\text{Erica}_{(2(1))}$]]

(15) *$\text{Who}_{(1)}$ does $\text{Adam}_{(1)}$ think [$t_{(1)}$ [$_s$· $t_{(1)}$ loves $\text{Erica}_{(2(1))}$]]

Does a *wh*-trace behave like an anaphor? *Wh*-traces do need a c-commanding antecedent. But the *wh*-constituent is co-indexed with its trace and it c-commands this trace because it is in an A' position. Binding theory does not address A' binding, so the possibility of *wh*-trace acting like an anaphor can be ruled out.

So, then, does a *wh*-trace behave like a pronoun? Is it free in its governing category? Condition B of the binding theory says that pronominal elements must be free in their GC. That is, a pronoun may be bound by something outside its GC. So if *wh*-traces behave in the same manner as pronouns, then they should have the same distribution.

In (14), the pronoun *he* is coreferential with the NP *Adam*. This is possible because the NP is outside the GC for the pronoun. According to current binding theory, in (15), the lowest trace of *who* is indeed in the same position as the pronoun *he* in (14). But taken out of context, the natural answer to the question posed in (15) would not be that 'Adam thinks that he himself loves Erica.' That is, current binding theory would make it impossible to co-index *Adam* with *who* and the traces of *who*.

This current state of the binding theory would then present a case for *wh*-trace to act like R-expressions. Principle C of the binding theory insists that *wh*-traces would have to be free everywhere. And that seems to be true. However, this would determine that *who* in 15 could not then be bound to *Adam*. Haegeman concludes, then that *wh*-traces are like R-expressions.

Also to be considered is the Leftness Condition.

(16) A *wh*-trace cannot be co-indexed with a pronoun to its left.

This would preclude the *wh*-trace in (15) from being co-indexed with *Adam*.

The following data is offered as evidence for the position that a discourse could allow the co-indexing of *wh*-trace with a pronoun or noun to its left. It is a transcription of dialogue overheard recently on a popular soap opera. The participants are Adam, a very rich and powerful man; Adam's illegitimate teenage daughter, Hayley (until recently unknown to exist); and Stuart, Adam's retarded twin brother. Recall that this dialogue does, after all, come from a soap. But it is in standard English, and it is certainly comprehensible.

Adam: These past few months, I haven't had a companion, and I'm not at my best without one.

Hayley: Listen, if you're gonna gab about your love life, I'm really not up to it. Is this the kind of stuff fathers talk to their daughters about, really?

Adam: This stuff? We're not talking stuff! We're talking about the essence of the universe. We're talking about the one thing each and everyone of us want more than anything else in the world. To love someone and have them love us. I'm not talking about just anyone here. I'm talking about that one person in a billion who's perfect for us, our soulmate.

Hayley: Oh boy!

Adam: I've had my eye on this delectable creature for some time now, and well, last night, I gave her the good news.

Hayley: You told her you picked her.

Adam: No, no. There was no picking. This is destiny. This is two people coming together who are fated to be together.

Hayley: Who is the lucky lady?

Adam: Someone you like. Someone of whom I know you approve.

Hayley: Well, who?

Adam: Erica Kane.

Hayley: You're trying to make me laugh, right? Take my mind off the trial?

Adam: Yes, yes, Erica.

Hayley: Erica?

Adam: Yes, yes. Haven't you seen it, Hayley? When Erica and I are in a room together, we ignite. It's the most amazing phenomenon in the world. We get along and then we don't get along. We drive each other mad and then turn right around and love each other. Erica and I had a rather disastrous marriage, you know.

Hayley: So I've heard.

Adam: But suddenly, out of the ashes of that relationship, this phoenix has arisen.

Hayley: Are you sure Erica has the same slant on this? I mean, are you sure she wants you guys to be a twosome again?

Adam: She's not totally conscious of it yet, no, but I'm sure she has the same feelings I do.

Hayley: Yeah, right.

Adam: Well, she's being a little cautious, as rightly she should be. But I'm sure she's just as excited about this revival as I am.

(Doorbell rings and Hayley answers the door.)

Stuart: Hi.

Hayley: Oh, hi, Stuart. How's it going?

Stuart: Fine. I just thought I'd stop by before school to see if you're ok.

Hayley: I'm just Jim-dandy.

Adam: Good morning, Stuart.

Stuart: Adam. I didn't expect you back this early.

Adam: I flew on the wings of eagles.

Hayley: Don't mind him, Stuart. His phoenix is rising. You know, he's talking about the latest love of his life, Erica Kane.

Suppose at this point, Stuart simply asks, "What's going on, Hayley?" prompting Hayley to relate her conversation with her father. Suppose further that after relating the story to this point, Hayley, a hyped-up, disgusted and excitable teenager, continues her narrative to Stuart in the following manner:

> Hayley: What's going on? Are you kidding? That's what's going on. My own father, off on another wild goose chase. Who does he think he loves? He thinks he loves Erica. We all know that's not true, but he thinks it. And to make matters even worse, Who does he think Erica loves? He thinks Erica loves him!

This is definitely a situation in English where the following indices are indeed allowed to produce a grammatical sentence.

(17) $\text{Who}_{(1)}$ does $\text{Adam}_{(1)}$ think $t_{(1)}$ loves $\text{Erica}_{(2(1))}$
(18) $\text{Who}_{(1)}$ does $\text{Adam}_{(1)}$ think $\text{Erica}_{(2(1))}$ loves $t_{(1(2))}$

I propose the following explanation for the phenomena demonstrated above.

Chomsky (1988) notes that binding theory concerns itself with connections among noun phrases that have to do with such semantic properties as dependence of reference. Included are the connections between referring expressions and their antecedents. He explains that this theory deals with one of the subparts of the language faculty and this subsystem in turn interacts with other subsystems to yield an array of complex linguistic phenomena. I believe one such subsystem that supersedes strict binding principles is pragmatic discourse constraints.

Jakobson (1990) explains that

> Shifters are elements in the code whose general messages can be specified only by taking into account their use in messages, because this meaning incorporates a conceptualization having to do with particular elements of the speech event. For example, pronouns designate speaker, addressee, and context...(p. 17)

Since the early Middle Ages, it has been asserted again and again that the word out of context has no meaning. This is a bit strong, but Jakobson offers an interesting example of how this problem can manifest itself in speech. For selection deficiency aphasics, the context is indispensable and decisive. Speech for these aphasics is reactive. That is, an aphasic can easily carry on conversation but will have a pretty hard time starting one. He has to be put into a context in order to communicate. The more his utterances are dependent on discourse, the better he copes with his verbal task. For example, the sentence "it rains" cannot be produced unless the aphasic sees that it is actually raining. So, the more a word is dependent on the other words in the same sentence or in the same discourse and the more it refers to the syntactic context, the less it is affected by the speech disturbance. Words syntactically subordinated by grammatical agreement or government are more tenacious, whereas the main subordinating agent of the sentence tends to be omitted. Words with an inherent reference to the context, such as pronouns and pronominal adverbs, and words serving merely to construct the context, such as connectives

and auxiliaries, are particularly prone to survive. Referring expressions seem to be a part of the framework of the language. They work as the connecting links of communication and need discourse to come alive and have meaning.

I think Jakobson's expanded definition of "shifter" sheds light on this problem.

> (A) "shifter" is characterized by a reference to the given speech event in which the form appears...The first-person form of...the first-person pronoun is a shifter because the basic meaning of the first person involves a reference to the author of the given act of speech. Similarly, the second-person pronoun contains a reference to the addressee to whom the speech event in question is directed. If the addressers and addressees change in the course of the conversation, then the material content of the forms *I* and *you* also change. **They shift** (emphasis mine) (p. 175).

That is, forms which depend on the discourse for part of their meaning must be able to connect to whatever part of the discourse supplies that meaning.

Sebeok (1986) uses the example of one of Ulysses S. Grant's last communications to discuss pronouns at some length. Grant's hand-written note is short in length but loaded with meaning:

> "I do not sleep though I sometimes doze a little. If up I am talked to and in my efforts to answer cause pain. The fact is I think I am a verb instead of a personal pronoun. A verb is anything that signifies to be; to do or to suffer. I signify all three" (p. 2).

Sebeok quotes Peirce's understanding of the pronoun as needing to be defined as "a word which may indicate anything to which the first and second persons have suitable real connections, by calling the attention of the second person to it" (p. 8). He then explains that Grant saw himself as a verb rather than as a personal pronoun certainly not by mischance, but by a respectable linguistic convention. He merely called the other person's attention to the fact. Ricoeur (1974) as well had the understanding that

> outside the reference to a particular individual who designates himself in saying *I*, the personal pronoun is an empty sign that anyone can seize: the pronoun is waiting there, in my language, like an instrument available for converting the language into discourse through my appropriation of the empty sign.

I conclude, therefore, that the rigidity inherent in binding theory fails to account for the fact that referring expressions often can and must reach outside a sentence for their antecedents, and there are times when antecedents are common to more than one referring expression, such as in the data in (17) and (18) above. The system of using indices is a workable system as long as word forms which derive part of their meaning from discourse are allowed free rein to search the discourse for their antecedents.

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Toward a Better Understanding of Universal Grammar: Evidence from Child Language

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Introduction

It is Chomsky's conviction that the most prominent feature of natural languages is the contrast between the structural complexity of these languages and the ease with which children learn to speak them. It is this "inductive leap" between linguistic experience and knowledge that Chomsky has characterized as "the fundamental problem of linguistic theory" (Wasow 1986:107; also see Chomsky 1972). For Chomsky (1957, 1965), theoretical adequacy requires satisfactory descriptions, models, and theories. 'Theoretical adequacy is achieved when a finite set of principles is discovered that not only accounts for all the language behaviors observed but also identifies the actual set of mechanisms used by language-learning children' (Bohannon and Warren-Leubecker 1989: 168). It is the peculiar language-specific properties which 'set the limit that linguistic theory aims to approach' (Chomsky 1980:1).

Within the tradition of Chomskyan thought, the central concept is the notion of a Universal Grammar (UG): 'the system of principles, conditions, and rules that are elements or properties of all human languages ... the essence of human language' (Chomsky 1976; In Cook 1988:1). In terms of UG, specific proposals have been advanced in the most current model known as the Government and Binding Theory (Chomsky 1981).

In this paper, I propose that by taking into account the form of a particular grammar (syntax) and its use by children in discourse, the adequacy of the GB theory can be empirically tested, as well as perhaps explain particular phenomena of child language acquisition. First, I will consider the general nature and goals of the Binding Theory (BT). In particular, I will focus on Principle A: the relationship between an anaphoric reflexive pronoun and its obligatory NP antecedent. Second, I will consider the Case Theory module in conjunction with Binding Theory in order to shed some light on the following question: What can the Binding Theory and Case Theory tells us about children's acquisition of anaphora? And third, I will consider the notion of "Proper Binding Domain" proposed by Torres (1991). Does evidence from child language acquisition support the theory of Proper Binding Domain as a supplement to the binding theory which acts 'as an interface between the form of the grammar and its use in discourse pragmatics?'

It should be noted that all of the examples presented in this paper are the actual utterances a 5 year old male, who at the time of the discourse interaction, was describing his collection of dinosaurs to me.[1]

The Binding Theory

ANAPHORIC RELATIONS. The main concern of the Binding Theory is to show how different categories of NP are distributed in the sentence. In English, for example, reflexive pronouns such as *himself*, reciprocals such as *each other*, pronominals such as *him*, and common nouns such as

[1]See the appendix for the transcription of the entire discourse interaction.

Sam or *Pat*, are referring expressions that elicit a unique relationship. In general, the binding theory aspires to provide an 'explicit formulation of the grammatical constraints on NP interpretation in argument positions or A-positions. It is a theory of A-binding' (Haegeman 1991:191).

For the purposes of this paper, the working definition of anaphora that I will employ is one which is given by Lust (1980:74) as follows: 'Anaphora refers to the natural language situation wherein a term must be interpreted by reference to another term in a sentence or discourse.' The previous definition is particularly important to the general goal of this paper because where most formal grammars prefer to limit their structural analysis to the level of the sentence, this paper will consider the impact of considering the grammar as it was generated at the discourse level.

The immediate concern has to do with the anaphoric relationship between reflexive pronouns and their obligatory NP antecedents. Because reflexives lack independent reference they must have an antecedent to which it binds. Consider the following example:

(1) But he was a meateater with um ... actually three claws, actually like five claws and *he* could rip into something bigger than *himself*.

In example (1) above, the pronoun *he* serves as the NP antecedent to which the reflexive *himself* is bound. In other words, if an expression is in a certain structural relationship to another and is coindexed with it, it is bound to it. As such, Principle A of the Binding Theory, as presented by Lasnik (1988:36) is stated as follows:

(2) An anaphor must be bound in its governing category.

GOVERNING CATEGORY. An important property of the BT with regard to Principle A is that the antecedent and the reflexive must be coindexed. That is, 'if two NPs have the same index, they are coreferential' (Lasnik 1988:45).

In addition to coindexation though, binding is also defined in terms of (c)onstituent-command which is defined by Lasnik (1988:32) as follows:

(3) For A, B nodes in a tree
A c-commands B iff every branching node dominating A dominates B and neither A nor B dominates the other.

As a result, it is the usual case that the subject is in the c-commanding position of the clause.

It has been proposed that other attributes of the governing category include such characterizations as the Tensed Sentence Condition (TSC) which requires that the binding antecedent be within the same finite clause as the reflexive anaphor, and the Specified Subject Condition (SSC) which states that 'a subject cannot intervene between the binder and the bindee' (Lasnik 1988:35).

Before a final approximation of the GC can be proposed, however, the specialized reference to the SUBJECT must be characterized in relation to accessibility. According to Torres (1991) when SUBJECT is represented in capital letters it signifies and AGR-subject and a lexical NP-subject. Lasnik (1988:58) describes the notion of accessibility as follows:

(4) ß is accessible to α if
   a. ß c-commands α, and
   b. ß is not co-indexed with any category containing α

Thus, (4.b) refers to a grammatical principle known as the *i*-within-*i* filter.

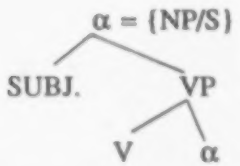
(5) The *i*-within-*i* filter
   $*[_{\alpha i} \ldots \beta_i \ldots]$ or $*[_{NP_i} \ [NP_i \ ]]$

Keeping the above information in mind then, a final approximation of GC is proposed by Lasnik (1988:58) as:

(6) The GC of α is the minimal NP or S containing α, a governor of α, and a SUBJECT accessible to α.

Torres (1991) points out the fact that 'the definition of governing category defines a domain that is syntactically equivalent to the domain of a clause.' Therefore, a diagrammatic representation equals the following:

(7)



Now, consider examples (8a) and (b) below. At first glance it might be tempting to say that the subject NP of the matrix clause *he* qualifies as a binding antecedent for the anaphoric reflexive *himself*. However, in the spirit of the notion of GC given above, it appears evident that we must account for the non-phonologically realized NP of the infinitival clause. Therefore, (8b) has been posited.

(8a) *He* had scaly skin to protect *himself*.

(b) *He* had scaly skin [PRO to protect *himself*]

The non-overt NP is indicated as PRO with regard to the syntactic representation. Haegeman (1991:244) writes that 'if we postulate that the infinitival clause has a non-overt subject, PRO, this subject can act as the binder of the reflexive', thereby satisfying the conditions of Principle A and the notion of GC. In addition, PRO is anaphoric in nature: it is dependent on another NP for its interpretation. Therefore, in considering what has been termed the control theory of GC, PRO is controlled by the main clause subject by co-indexation as in (8c) (cf. Chomsky 1980; Lasnik 1988; and Haegeman 1991).

(8c) *He*$_i$ had scaly skin [PRO$_i$ to protect *himself*$_i$]

Case Theory

CASE CATEGORIES. Case theory is one way in which the formal properties of overt NP's are integrated into the grammar. According to Baine and Hardy (1982:220) case categories have two interrelated functions:

> First, within the lexicon they have a semantic function: to distinguish the arguments of a predicate by providing each with a distinct label.
>
> The second function of case categories is syntactic: the rules use the case categories to identify arguments and specify where the arguments are to be found in sentences, so that both speaker and listener know when in the sentence the noun identifying the hitter is going to appear, and where the noun for who or what gets hit will be.

Although case categories are not as overt in English as they are in German, for example, they are still morphologically realized in the pronoun system with the exception of the 2nd person singular/plural form *you* and the 3rd person singular neutral *it*. However, it has been postulated that 'English has a fully-fledged system of **abstract case** ... We assume that abstract case is part of universal grammar' which parametrically varies by language (Haegeman 1991:144).

The case categories which are still morphologically realized in the English pronoun system are the following:

(9) NOMINATIVE- marks the NP in the subject position of finite clauses.

ACCUSATIVE- marks the object NP of a transitive verb, the subject NP of an infinitival subordinate clause, and an NP complement of a preposition.

GENITIVE- notes a case used primarily to indicate that a noun is a modifier of another noun, often to express possession, measure, origin etc.

Further, Givón (1984:147) points out that the nominative-accusative case-marking typology allows for the marking of subjectization. Givón explains that this type of case-marking displays 'the *pragmatic* unity of the category "subject", regardless of whether the verbal clause is transitive or intransitive, and regardless of the *semantic role* of the subject.'

CASE THEORY AND GB. The primary function of Case Theory within the theoretical framework of GB is to explain various restrictions that appear to have very little to do with case. That is, it explains the existence of Cases and their implications for the structure of the sentence. Lasnik (1988:10) refers to the general principle of UG which is involved as the Case-Filter:

(10) At S-Structure, every lexical NP needs Case.

Although the above statement of Case-Filter relates the general idea, perhaps a more accurate statement is one given by Chomsky (1986; In Cook 1988:139):

(11) Every phonetically realized NP must be assigned (abstract) Case.

The inclusion of abstract case in the statement of the Case-Filter is an important concern to the overall theory of UG because as Haegeman (1991:139) writes: 'Abstract case is a universal property, while the overt realization of abstract case by means of morphological case varies cross-linguistically.'

ACQUISITION OF ANAPHORA. With an understanding of the primary goals underlying both Binding Theory and Case Theory, perhaps some insight can be revealed concerning the acquisition of anaphora by children learning to speak English. For instance, consider example (12) below.

(12) *He was probably a twelve horned dinosaur and he didn't.. he could go in.. *he*$_i$ would protect *hisself*$_i$ with these horns.. but they weren't a frill.

What can we say about this data? First, it suggests that children do indeed exhibit knowledge of Principle A of the BT: an anaphor must be bound in its governing category. Knowledge of the principle of binding becomes evident in (12) by acknowledging the use of the English reflexive morpheme *-self*. The ungrammaticality of the utterance is related to improper case assignment. Here, the child assigned the genitive case to the 3rd person masculine form of the reflexive instead of the grammatical accusative case.

Second, example (12) supports the plausibility of such a notion as Case Theory. We cannot just dismiss the distribution of particular overt NP's as occurring in some sort of complementary distribution. Rather, the fact that the genitive case never occurs together with the reflexive form *-self* in adult language implies that case assignment is acquired as a separate process from that of binding. Further support is presented in (13):

(13) **He*$_i$ had two sets of horns [just [PRO$_i$ to protect *themself*$_i$]

As a result of the previous observation made in (12) and (13), I posit that the morphological realization of the accusative form of the anaphoric pronoun together with the reflexive marker *-self* are not considered a single lexical representation by the language learning child. Wasow (1986:108) notes that 'while adults may provide children with instruction regarding the case marking or gender or pronouns, parents do not seem to tell children how pronouns are associated with antecedents and interpreted.'

Proper Binding Domain

PROPER BINDING STATEMENT. When anaphoric pronouns are interpreted as bound variables, their analyses belong in part to the domain of semantics. In an attempt to capture the notion of semantic agreement between the features of the bound variables, a concept referred to as generalized agreement, Torres (1991) proposes a supplement to the BT which allows the collapse of Principles A and B into a single statement:

(14) Anaphors and Pronominals are properly bound in γ, where
(i) γ = a minimal NP or S and
(ii) no indexed element violates the *i*-within-*i* condition in γ

Thus, consider example (15) below:

(15) *He_i would use it [PRO_i to protect *$himselves_i$*]
γ

The Proper Binding Statement first assigns γ to the lower clause which satisfies the requirement that γ be equivalent to a minimal NP or S. Then, the anaphor in that domain is required to match the potential antecedent with the features person, number, and gender. As was stated earlier in this paper, the non-overt subject PRO is dependent on another NP for its interpretation. The Proper Binding Statement considers the non-phonetically realized subject PRO to function like a pronoun which is phonetically realized. Since PRO is proper in γ and is free to refer, He_i, PRO_i, and *$himselves_i$* are all coreferential as is signified by the indices. As a result, *he* and *himselves* must share agreement features. Example (15) is ungrammatical because the indexed elements lack AGR in terms of the feature, number.

With regard to the Proper Binding Statement, Torres (1991) remarks:

> if proper binding straightforwardly accounts for those cases in which a construction with indexed elements must be ungrammatical because the featural structure between antecedent and anaphor do not match, it can also, obviously, account for those cases in which the indexing in a construction must yield a grammatical structure, and this is thanks to the similarity in function between *i*-within-*i* and generalized agreement.

CASE AND PROPER BINDING. An intrinsic principle of UG is that it forbids two elements of the same Case to be coindexed within the clause. This fact is consistent with the underlying assumption of the *i*-within-*i* filter. Therefore, it follows that two Nominative NP's can not be properly bound in γ, or for that matter in terms of the BT, in the same GC. Briefly consider what the impact of above proposition is on example (16):

(16) *They could use their head to ram into the Tyrannosaurus Rex's stomach if *$they_i$* wanted to protect *$theirselves_i$* because they had bony heads, real bony and *$they_i$* could even use right down here to stab 'em or back here to protect *$theirselves_i$*.

In terms of Proper Binding, both sets of anaphoric expressions are properly bound in γ. Also, they exhibit generalized agreement in terms of AGR-number, AGR-person, and AGR-gender. Yet by adult speaker standards, the utterance is ungrammatical. The result, once again, emphasizes that importance of Case Theory in relation to binding.

Conclusion

A main goal of this paper was to empirically test GB theory by taking into account particular phenomena which occur in child language. As a general observation, children appear

to have basic intuitions concerning all of the mechanisms involved in properly binding a reflexive anaphor to an antecedent NP at a fairly young age: a fact which supports the theories proposed. Predictably, it is the child's errors which have provided the most insight into the nature of Universal Grammar.

Most notably, children make mistakes by assigning genitive case to reflexive NP's. This fact is not so surprising if you consider that the child may perceive the reflexive as consisting of two distinct elements, the genitive possessive pronoun as modifying the Noun *self*. Notice that the child never makes the mistake of using the nominative form of the pronoun with the reflexive.

The next step in this study should be to study the nature of coreference beyond the single sentence. For example, consider (17) below:

(17) **He* didn't have any weapons it.. *itself*. *It* had only these kind of weapons.. only.

In the above example, *he* and *itself* are bound in the GC. In terms of the Proper Binding Statement, however, the sentence is labelled ungrammatical because in lacks AGR-person. But notice the following sentence. Where the referential subject in the previous sentence was *he*, it is now *it*. If a subject NP can pick up its reference from the preceding reflexive anaphoric pronoun, what is the ensuing impact on linguistic theories such as those that have been discussed in this paper, that is, Binding Theory and Proper Binding? It is not my intention to deal with this problem here, yet it is interesting to consider nonetheless.

APPENDIX

This is a ..um..Brontosaurus and his neck is probably about 50 feet tall because it could eat like trees, like the trees outside it would be taller than them because..it..I saw a track of one in a museum and it's really big. It's bigger than my hand. It's probably from right over that chair right over to there. And I..um..I could probably lay down in it, maybe two persons could lay down in it because it was big and we even saw a leg bone from it and it's about as big as this house and not as fat (laugh). Not as big as this house but probably from that window to that window. No that one..over to there. And its neck..um..um..could bend down or its legs could move really far, they could probably crush the trees if it was walking through here. Sometimes they would crush the plants and they would be flat like..really flat like it's paper, probably as flat as paper. (Adult: Does that one eat plants or does he eat meat?) He eats plants and his tail was used for a weapon only. His tail was the only weapon he had. (A: Because he doesn't have sharp teeth, right?) Yeah he doesn't have.. yeah he has teeth. No he doesn't. (A: Well, he has teeth but not like...) They're not really sharp. They had to eat stones to help grind it up. And this is my bubble bath one. (Laugh)

This is a Stegosaurus and he had..um..more weapons. He used this for a weapon cause if the Tyrannosaurus Rex would bite it he could probably break his teeth out cause it was made out of stale bone and his tail could kill the Tyrannosaurus Rex cause it had sharp spikes, really sharp. And ..um..he could turn his head back and forth and his tale could go back and forth but this one can't. And his legs couldn't..he wasn't as big as Tyrannos..I mean.. as big as this guy. He was only as big as this house only his tail was longer than the house, probably down.. maybe.. maybe half long as our driveway, maybe down into the middle of our driveway. ***He*** **would use it to prec..protect** ***himselves***.

Here's two head bonkers, actually they're called peca.. pecalysecalosauruses. Their heads (A: Pecaly what?) Peca.. I can't say it right either, pecalosauruses. I call 'em pecalosauruses and their head was the only weapon and their tail was a weapon. So their tail and head was the only weapon they would have. ***They*** **could use their head to ram into the Tyrannosaurus Rex's stomach if they wanted to protect** ***theirselves*** **because they had a bony head, real bony and** ***they*** **could even use right down here to stab 'em or back here to protect** ***theirselves***. They had skin that was really hard, they have lots of layers of it and when they would fight they would do the same thing.. just hit 'em together.. as hard as they could.
Here's a duckbill and this one does not have a crest.. um.. some do and they have their.. they didn't have any weapons at all. They didn't. [*G's last response was to a questioning look from his mother] They um.. what their weapon was um.. it they were out in.. they would run out into the deep waters because they wouldn't drown like Tyrannosaurus Rex would cause they had sp.. they had.. um.. their nostrils were up on top of their head right there. Some with their crests had nostrils up on the top of the crest. If this one had a crest the crest was really as big as this house from.. maybe from here.. maybe as tall as me.. probably as tall.. as tall as me but his head.. we've seen a head and with the crest.. and probably.. but I don't think it.. somebody could fit in it cause it was an awfully small head. And.. but the dinosaur had a really small brain. It probably as big as..maybe that big. And it could think a lot. It could think what to do. Like it would go out into the waters. It could think up a lot.. with one little small brain.

Here's a dinosaur that.. like.. the water called.. I don't remember what he's called cause it's a

hard name.. I don't even know what he was called. Some.. he would.. um.. he has paddled little feet so he could paddle through the water and.. he would eat meat cause he got sharp teeth and he would even eat plants. ***He* got this stuff to protect *himself*, hard scaly skin.. just to protect *himself* from the meat eaters that would dig him out of the water and.. maybe bite him.** The skin is very hard to get.. um.. to break. It's kinda like wood and.. it.. the tail is its only weapon too.. and its jaw were too.. cause it could really bite hard.

Here's a Triceratops and here's another one. These two.. this is the b.. the.. regularly sized one. When they were babies they wouldn't be this small, they would be bigger then.. bigger than this, maybe.. um.. about that big.. this tall. And mothers were way bigger. I'm.. their skulls.. um.. were huge. They had to use a lot of glass to get 'em into a glass thing to protect 'em. And their outer skull.. that.. is.. pretty big. The mouths were meant for chewing. The jaws back in the background were meant for grinding.. um.. plants and so was the.. teeth, they weren't very sharp but they were sharp to grind you. They would have to use stones to bite.. through.. the hard stuff because it..but they had.. but they um.. because somethimes they..their teeth would get.. but that would wear out their teeth so they would eat.. they.. somethimes they would eat the stones just to help grind up and that would wear out their teeth anyway because the plants were softer. Here's another one. Um.. this one's smaller and he has the horns.. like on this guy. Um.. their back scales were the only protection.. and their horns.. they could use to kill the Tyrannosaurus Rex with their horns.

Here's a Stegosaurus but he's different cause.. this is an African Stegosaurus cause they live down in Africa.. cause they look like this cause the African ones.. were.. kinda like meat eaters but they..um.. had claws just to grab into the ground. That.. um.. the dinosaurs down there were very.. had very tough teeth, so they had boney spikes and they had three on one side and two on the other side so if they wanted to just kinda wound it they would use two and if they wanted to really hurt.. if they wanted to teach it.. cause they would use both of 'em and they're both the same strength.. um.. so like.. if they.. they would both wound it or kill it.. so if these two.. um.. stuck into its heart or its stomach it could kill it.

Here's an.. um.. African Ankylosaurus. ***He* didn't have any weapons it.. *itself*. *It* had only these kind of weapons.. only.** They were not weapons they were things to protect them and.. um.. they could protect their head.. cause they had hard skin on their head.

Here's the regular kind of Ankylosaurus. He had t.. he had horns on.. right down here.. and up here. ***He* had two sets of horns.. just to protect *themself* right here and right here.. up here.** And he had a hard head and a hard scaly thing. And then back in the background he had a c.. hard club on his.. thing.. so he could wack the Tyrannosaurus Rex really hard an'.. probably would hurt.. to wack sombody in these days. These things.. they're.. those things would probably be about this big around, maybe as big as my Mom's head.. I bet (laugh). Maybe as big as persons head because they would use 'em for protection.. like the Stegosaurus.

I don't know what this.. this guys called? This guy is a rather.. big dinosaur.. more horns than.. I don't know what he's called.. No.. there isn't no name and he has one.. one two three..... twelve.. twelve horns. **He was probably a twelve horned dinosaur and.. he didn't.. he could go in.. *he* would protect *hisself* with these horns.. but they weren't a frill.** They would

protect his neck and back in the back.. if he got bit there he wouldn't be really dead. No (Different child: No there's thirteen) No. (cause the one) No, right there? No, that's not.. there isn't thirteen.

Here's Tyrannosaurus Rex. Um.. he ate meat. He was the biggest meat eater. They made him kinda wrong cause they put these spiked thumbs. **And *he* had some scales going down his back, not to protect *himself* but just kinda so he would look fiercer** [pronounced 'fyusr']. He'd even use his tale for a weapon. His claws could kill.. um.. he didn't need a weapon actually, cause he was more fiercer than any other dinosaur, he could kill most of the.. any dinosaur.. even his own kind of an.. ances.. even his own.. kind. The strongest and the oldest could probably kill his own kind that was even stronger than him.. because their teeth.. when they get really old their teeth get like.. brittle.. like I mean like.. metal. You can't push in.. on 'em they could.. somebody really when they're back in.. then.. it could.. somebody could fit in their skull. They could just swollow somebody an'.. they would just go down their throat.

Here's a dimetrodon. He.. um.. didn't.. he would need some protection but he didn't ne.. have any. He had his claws for protection. But this was not any protection. This was to keep.. the heat or the um.. keep coolin' down. He was an.. also a meat eater. ***He* had scullies.. scaly skin to protect *himself*.** His head wasn't very hard. His neck wasn't hard at all.. because um.. that's where.. cause he didn't need a hard neck. Well.. he did but he didn't have one because Tyrannosaurus Rex could bite through it.

(What's this? Oh..) This is a Sa(v)er toothed tiger, he lived back in the other times.. um.. right after the dinosaurs. And.. he actually.. why he was called Sa(v)er toothered cause he had two teeth.. really big like this. See those teeth hangin' out. (A: In the front?) Uh huh, right back here. Those were da.. um.. his killing teeth so he could rip in the meat and this is a skeleton of him.. one of 'em.. but not a real skeleton it's a m.. probably dis um.. a.. thing.

Here's an um.. this is a um.. wait.. that big one was a Broncheosaurus right there cause kinda the lump is on him.

This is a Brontosaurus which was actually smaller than Brocheosaurus. Brocheosaurus had a neck about 50 feet long maybe.. no I don't think so. You know like I told you. This guy only had a neck probably as tall as.. as long as this house. The Brocheosaurus was taller than this guy. This guy would look like a little baby to the Brocheosaurus.

(I can't find what I want. Oh, here it is.)

This is a um.. little meat eater. He was a.. he was called.. Dimetrodon which was a (inaudible attempt at some word) I don't know what his name. It was a (more inaudible) **But he was a meat eater with um.. actually three claws, actually like five claws and *he* could rip into something bigger than *himself*.** Like a Brocheosaurus he could kill with lots of bites only.. cause he was a poisonous he had a poisonous mouth.. inside.. because he had two jaws of it hanging out when he bit.. (A: hum) to kill the dinosaur harder.

Here's an iguana. They lived back in the dinosaur times and.. they just have spiky feet (laugh) that's all (laugh) about that guy. Here's another Triceratops. (Oh...)

This was a um.. these were both.. (What were these guys called? ...(6sec pause)... Tyran..) Tyrannodons. These were (laughs from listeners) I can't remember their names cause they're hard. These are Tyrannodons cause they had big.. foreheads, just to.. kinda help the heat an.. help 'em glide. Their wings were like f.. they 'r they were like fifty feet long. So.. and their legs could help 'em land or um.. and even their beak was sharp, really sharp. Um.. they bu.. they were meant for killing um.. fish and their hands were not.. were not.. (inaudible) well they were kinda. Their hands were for battle sometimes and even their legs or their beaks. And.. whenever they fought they would.. pretty make damage on the other one and both of 'em would be damage up, so. (A: That would be kinda scary up in the air, fightin' like that) I know, so would I. They could fly like.. maybe.., probably as high as an airplane (A: wow) an' they could still breathe. There's no air up there but they could still breathe.. cause they could take air up from down below an' use it.. but not even let it out, just use it to breathe in.. but they wouldn't let it go out. (A: Then they'd hafta go back down and get more air?) Yeah, that would take 'em a long time probably like.. hou.. an hour.

(A: I don't think I'd wanna live back when dinosaurs did, would you?)

I don't think you would want to anyway cause you would only probably live up to maybe fourteen or like only you would be like three an' they would an' you would die or maybe just be a baby and die cause the big dinosaurs like Tyrannosaurus Rex.

(A: I bet they'd like to eat us too, don't you think?)

He would eat anything that he could get his hands on.

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Re-examination of the Notion of Proper Binding: The Interpretation of Reflexives in Japanese

Teruo Ueno

1. Introduction

In his working paper, Torres (1991) proposes the notion of proper binding as a supplementary statement to the Binding Theory. The statement rules in as grammatical "all constructions in which an anaphor or a bound pronominal agrees with its antecedent in terms of person, number, and gender," and rules out as ungrammatical "those constructions in which such agreement does not occur" (Torres, 1991: 2). In other words, proper binding, letting semantics creep in, judges grammaticality of sentences on the basis of generalized agreement between an anaphor and its potential antecedent, but not on the basis of the definition of "binding". Because of this semantic nature of proper binding, he further claims that proper binding is fairly directly related to discourse pragmatics, serving as "an interface between the form of the grammar and its use in discourse pragmatics."

In this paper, I would like to present an argument for the notion of proper binding through the interpretation of Japanese reflexives, *jibun* "self", *jibun-jishin* "self-self", and *kare-jishin* "he-self".[1]

In the next section, I will briefly summarize the characteristics of the Japanese reflexives *jibun* , *jibun-jishin*, and *kare-jishin*, introducing Katada's (1991) three-way classification with respect to Raising. In the third section, I will describe the morphological structure and semantic function of the three reflexives, claiming that *jibun* and *jibun-jishin* share the same semantic function, which would lead to the same behavior with respect to co-reference with the antecedent. In the last section, I will apply the notion of proper binding to these Japanese reflexives to see how proper binding deals with the ambiguous constructions which are normally unmentioned in the Binding Theory.

2. Three-way Classification of *jibun*, *jibun-jishin*, and *kare-jishin*

Katada (1991) makes a three-way classification of these reflexives in terms of locality of binding, and subject orientation in identifying their antecedents:

(a) long-distance anaphors with subject orientation (e.g., *jibun*),
(b) local anaphors with subject orientation (e.g., *jibun-jishin*),
(c) local anaphors with subject orientation (e.g., *kare-jishin*).

[1] Although *jishin* originally means "own body", I will translate it as "self" in this paper, following the recent literature discussing the Japanese reflexives. *Jishin* is also used as an independent word with the meaning of *jibun* "self", although the latter is much more often used than the former.

The three-way contrasts above are exemplified in the following sentence[2].

(1) John$_i$-ga	[Bill$_j$-ga	Mike$_k$-ni		jibun$_{i/j/*k}$ jibun-jishin?$_{*i/j/*k}$ kare-jishin?$_{*i/j/k}$	-no
John NOM	Bill NOM	Mike DAT			GEN
koto-o	hanashita		to]	itta.	
thing ACC	told		COMP	said	

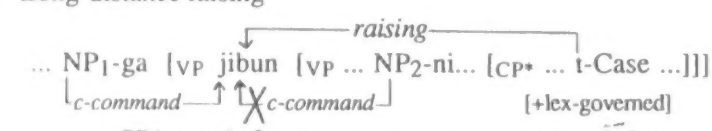
'John said that Bill told Mike about self.'

According to Katada (1991), *jibun* in (1) may refer back to *John*, subject of the matrix sentence (i.e., a higher clause) as well as *Bill*, subject of the embedded (or lower) clause. (Therefore *jibun* is a long-distance anaphor with subject orientation.) *Jibun-jishin*, on the other hand, can refer only to the clausemate subject Bill. (Therefore *Jibun-jishin* is a local anaphor with subject orientation.) Further, *kare-jishin* can pick up as its antecedents either the NOM or DAT NP in the same clause, but not in the higher clause. (Therefore *kare-jishin* is a local anaphor with no particular orientation.)

Katada (1991), then, tries to reduce these contrasts to the contrastive behaviors of the reflexives in terms of raising in LF, by introducing the notion of operator/nonoperator anaphors. He claims that *jibun* is an operator anaphor and is raised to an operator position (A'-position) by way of VP adjunction in LF, the domain of which adjunction is not limited if the operator is lexically governed by a case marker. This multiple VP-adjunction sites account for the long-distance behavior of *jibun*, which may pick up as its antecedent even the subject of the higher clause. On the other hand, *kare-jishin* is a nonoperator anaphor, hence undergoes no raising. His explanation of *jibun-jishin* is unique in that since *jibun-* in *jibun-jishin* is lexically ungoverned (i.e., case marker is not attached), it cannot land at multiple VP-adjunction sites as *jibun* does because of the ECP; that is, when *jibun-* undergoes raising, its lexically ungoverned trace has to be antecedent-governed, resulting in the limitation of the domain where *jibun-* can land without violating the ECP. In short, *jibun-* cannot be raised beyond the clause boundary. This behavior of local raising, Katada (1991) argues, explains the property of local binding with subject orientation exemplified by *jibun-jishin*.

The argument is summarized in the following LF representations:

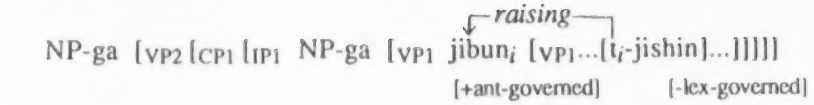
(2) Long-distance raising



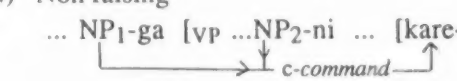
CP* stands for zero or more occurrences of clauses.

[2]The example is from Katada (1991) with my slight modifications in rominized writing, and in grammatical notation. Grammatical notation used in this paper is as follows; NOM = nominative, DAT = dative, ACC = accusative, GEN = genitive, and COMP = complementizer.

(3) Local raising



(4) Non raising



Although Katada's explanation nicely describes most of the phenomena, it involves highly abstract form of representations and many assumptions[3]. Moreover, his theory does not say anything about grammaticality judgement marked as '?*' in the example (1). The symbol '?' or '?*' is obviously different from '*', which is marked for a construction clearly 'ungrammatical'. However, Katada's explanation fails to account for the difference between them. According to his three-way classification of reflexives, there should not be a construction judged as '?' or '?*'. For example, *kare-jishin* in (1) should never be co-indexed with the higher clause subject *John* because of its non-raising property as a nonoperator. Accordingly it should be clearly marked as '*', not as '?*'.

In the next section, let us examine the morphological structure and semantic functions of the three reflexives in question.

3. The morphological structure and semantic functions of *jibun*, *jibun-jishin*, and *kare-jishin*

First, it should be noted that *-jishin* in *jibun-jishin* is a very productive reflexive marker, practically turning every noun and pronoun into a reflexive or emphatic form. For example, not only *watashi-jishin* 'I-self', *watashi-tachi-jishin* 'we-self', *kanojo-jishin* 'she-self', *sore-jishin* 'it-self', *karera-jishin* 'they-self', *anata-jishin* 'you-self', and *anata-tachi-jishin* 'you-PLURAL-self', the possibility of all of which can be inferred from the structure of *kare-jishin* 'he-self', but also the combination 'NOUN[+animate]-*jishin*', such as *inu-jishin* 'dog-self', *Yamada-san-jishin* 'Yamada-Mr.-self', *otoosan-jishin* 'Father-self' etc. are possible. Moreover, the high productivity of *-jishin* has stretched the semantic domain of *-jishin* to the inanimate, for which there is a separate reflexive marker, *-jitai*. For instance, *keikaku-jishin* 'plan-self', *ongaku-jishin* 'music-self', *kami-jishin* 'paper-self' e.t.c. are

[3]Concerning syntactic connectedness (,or connectivity) in backward reflexivization seen in scrambled constructions, he proposes that operators must remain in A'-position, while nonoperators must undergo reconstruction in LF. Indeed, the proposed statement is able to handle constructions involving scrambling, but he does not explain why that is the case. In other words, the motivation of the different behavior in reconstruction in LF between operators and nonoperators is not presented at all, giving us the impression that the stipulation is *ad hoc*.

possible, although some might insist, from a prescriptive point of view, that *-jitai* should be exclusively used for the inanimate.[4]

Just like in English, reflexive forms in Japanese have two semantic functions; that is, (i) emphatic function, and (ii) pure reflexive function. Words with *jibun*/*-jitai* are exclusively used for the former, and both *jibun* and *-jishin*/*-jitai* forms are used for the latter. The following sentences (5)-(7) will illustrate this point.

(5) Tanaka-wa Yamada-jishin-ni atta.
Tanaka NOM Yamada-self DAT saw
'Tanaka saw Yamada himself.' (Emphatic use of *-jishin*)

(6) Tanaka$_i$-wa { kare-jishin$_i$-o / jibun-jishin$_i$-o } waratta.
Tanaka NOM { he-self ACC / self-self ACC } laughed
'Tanaka laughed at himself.' (Reflexive use of *-jishin*)

(7) Tanaka$_i$-wa jibun$_i$-o waratta.[5]
Tanaka NOM self ACC laughed
'Tanaka laughed at himself.' (Reflexive use of *jibun*)

In short, *-jishin* could be attached to any noun/pronoun to make a reflexive form, which, in turn, has two functions, (i) as a semantic emphasizer of a noun/pronoun in apposition to itself, and (ii) as a pure reflexive, while *jibun* has only the latter function.

Here, I would like to claim that the pure reflexive function the word *jibun* has, whether used independently or together with *-jishin*, plays a crucial role in picking up the subject as its antecedent. On the other hand, considering the fact that *kare-jishin* is, as I described above, formed by attaching *-jishin* to a pronoun *kare*, it will not be unreasonable to think that the

[4]In fact, contrary to the expected argument against the examples here, the first phrase *keikaku-jishin* is taken from *Gendai Kokugo Reikai Jiten* (Shogakukan, 1985), one of the most widely used Japanese dictionaries among secondary school students.

[5]McCawley (1989) argues that *jibun* is not fully acceptable when its antecedent is the subject of the same clause. However, I claim that the ambiguity concerning the referent of *jibun* is derived from the double meanings of the word, not from the syntactic constraint on *jibun*: That is, *jibun* can be used in two different ways, i.e., (i) as a pure reflexive, and (ii) as a pronoun referring to the speaker/writer of the sentence. When the discourse cannot fully specify which reading should be taken, the ambiguity occurs, which is often the case with the examples of those linguists who deal with a single sentence independently of the context. Therefore, the ambiguity is caused not by the improbability of co-reference of the anaphor with the clausemate subject because of some inherent nature of *jibun*, but simply by the double meanings it possesses. Without being fully aware of this fact, the grammaticality judgement of (7) will differ from one person to another. For example, Miyara (1982) does not mark this type of construction as ungrammatical or ambiguous, while Katada (1991)'s judgement is the same as McCawley's, namely '?'.

strength of the reflexive function of *kare-jishin* is a little weakend or softened by the pronominal character it inherits from the pronoun *kare*.

This claim implies that in principle, *jibun-jishin* can pick up as its antecedent the subject exactly the same way as *jibun* does, whether the subject is in a higher clause or not, because of the pure (or unweakened) reflexive function it possesses, and that *kare-jishin* may refer to virtually any noun/pronoun if the noun/pronoun referred to is [+animate][+male], which features *kare* has, and therefore requires of its antecedent.

Now let us examine how this claim, interacting with the notion of proper binding, accounts for the data.

4. Application of Proper Binding to Japanese Reflexives

Torres (1991: 5), collapsing Conditions A and B, states proper binding as follows:

(8) Proper Binding Statement
Anaphors and Pronouns are properly bound in g, where
(i) g = a minimal NP or S, and
(ii) no indexed element in g violates the i-within-i condition.

Keeping in mind the statement (8), and the claim that proper binding makes use of Agreement features, let us analyze the following sentence.

(9) Tom$_i$-wa	Jane$_j$-ni	sono	machi-no	kankyo-wa$_k$
Tom NOM	Jane DAT	that	town GEN	environment NOM
jibun$_{i/*j/*k}$				
jibun-jishin$_{i/*j/*k}$ -ni		awanai	to	itta
kare$_{i/*j/*k}$				
	ACC	unfit	COMP	told

'Tom told Jane that the environment of that town didn't fit self.'

There is no ambiguity whatsoever in interpreting the antecedent of these reflexives. Note that *jibun-jishin* and *kare-jishin* pick up as their antecedent the subject of the higher clause, namely *Tom*, which phenomenon cannot be explained with Katada's operator/nonoperator dichotomy. In fact, the possibility of co-reference of *jibun-jishin* and *kare-jishin* with the subject of the higher clause is excluded in his three-way classification of Japanese reflexives.

The unambiguous co-reference of *jibun-jishin* and *kare-jishin* with *Tom* is, however, straightforwardly explainable with the proper binding statement. *Kare-jishin*, inherited the features [+human][+male] from a pronoun *kare*, has no way of referring to *kankyo*, or *Jane*, which has the feature [-human] and [-male] respectively. In other words, having failed to find the antecedent of *kare-jishin* in the g assigned to the lower clause because of the mismatch of the Agreement features (hence, g = /-proper/), the Proper Binding Statement stretches g to the

higher clause in search of a potential antecedent of *kare-jishin*, where it identifies *Tom* but not *Jane* as the antecedent, based on the feature agreement between *Tom* and *kare-jishin* (hence g = /+proper/, and *kare-jishin* is properly bound in g). If the main clause subject in (9) were *Mary* instead of *Tom* when the reflexive is *kare-jishin*, the Proper Binding Statement fails to assign g to the higher clause too, resulting in the improper binding of *kare-jishin*.

As for the possibility of co-reference of *jibun* and *jibun-jishin* with *Jane*, it is ruled out because of another important feature of the two reflexives, i.e., [+subject referring], by which I mean the feature that requires the antecedent to have the subject status, and with which the feature [+subject] matches.[6]

As we have seen, (9) clearly supports the claim that I made at the end of the previous section: (i) There is no difference between *jibun* and *jibun-jishin* in the behavior of identifying their antecedent, i.e., there is no constraint on *jibun-jishin* that it should look for its antecedent only in the clause it is in. In fact, both can pick up as their antecedent the subject NP whether or not it is their clausemate, as long as their Agreement features match with those of the subject NP. Further, (ii) *kare-jishin* can refer to any NP, as long as the Agreement features of each other match. In short, there is no structural constraint on the three reflexives, in terms of the lower/higher clause.

The above argument holds good even if we look at a fairly complicated sentence such as (10) below.

(10) [Tom$_i$-wa Nancy$_j$-ni [Mary$_k$-ga [Jane$_l$-no haha$_m$-wa
Tom NOM Nancy DAT Mary NOM Jane GEN mother NOM
kare-jishin$_{i/*j/*k/*l/*m}$-o kiratteiru] to omotteiru] to itta]
he-self ACC hate COMP think COMP told

'Tom told Nancy that Mary thought that Jane's mother hated himself.'

In (10), the reflexive *kare-jishin* crosses two S boundaries to search for its proper binder with the features of [+human][+male], finding only *Tom* as the qualified antecedent. The proper Binding Statement has no problem in dealing with this even quite artificially complicated sentence, while Katada(1991)'s theory, not allowing the raising of *kare-jishin*, fails completely.

Now, let's suppose that the reflexive used in the above sentence (10) is *kanojo-jishin* 'she-self', not *kare-jishin*. Then we would have a very ambiguous sentence (11); 'ambiguous' in a sense that there are more than one potential antecedents which share the same Agreement features with the reflexive, but not 'ungrammatical' in a sense that the sentence is wrongly constructed, both syntactically and semantically. Put it differently, it is possible to interpret the meaning of (11) in more than a single way, creating ambiguity, but not ungrammaticality of the sentence.

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[6]Here, it may seem that I am mixing semantic features with syntactic features, but since [subject (referring)] is actually derived from the semantic feature [agent] in the active voice, and [recipient] in the passive voice, it would not be improper to use the word 'subject' for the convenience' sake.

(11) [Tom$_i$-wa Nancy$_j$-ni [Mary$_k$-ga [Jane$_l$-no haha$_m$-wa
Tom NOM Nancy DAT Mary NOM Jane GEN mother NOM
kanojo-jishin*$_{i/?j/?k/l/m}$ -o kiratteiru] to omotteiru] to itta]
she-self ACC hate COMP think COMP told

'Tom told Nancy that Mary thought that Jane's mother hated herself.'

Applying the Proper Binding Statement, such an ambiguous situation will be explained as follows:

The Proper Binding Statement first assigns g to the lowest clause, and then has the reflexive find its antecedent with the same Agreement features as its own. In the case of (11), for example, two nouns in the lowest clause, *Jane* and *mother* having the features [+human][-male], will be identified as a potential antecedent of *kanojo-jishin*. Since the two nouns are equally qualified as the antecedent of the reflexive, the choice between the two really depends on the context, or pragmatic discourse. Having successfully identified the antecedent, the reflexive will most naturally stop its search for the antecedent there, without extending the searching domain (i.e., g) to a higher clause, unless the discourse forces it to do so. This is the most straightforward way of interpreting the reflexive in question. I suppose that this straightforward interpretation is the main reason the reflexives in the form of X-*jishin* are often claimed to be locally (i.e., in the same clause as their antecedent) bound.

However, if the context does not allow the *kanojo-jishin* to take either *Jane* or *mother* as its antecedent, the Proper Binding Statement will let the reflexive extend its searching domain to the next higher clause, and if the context does not allow it to pick up *Mary* there either, then it will again search for its antecedent in the next higher clause, where *Nancy* will be identified as a potential antecedent. As long as the discourse context does not give a warning against the new reading, *kanojo-jishin* is properly bound with *Nancy* in that new g. Syntactically and semantically, there is nothing wrong or illegal with this operation, therefore, nothing wrong or ungrammatical with the interpretation of (11), where *Nancy* and *kanojo-jishin* are co-referential. The ambiguity of (11), as marked '?', is, therefore, not caused by the impossibility of such co-reference, but simply by the multiple choice type of decision we are forced to make out of many potential antecedents.

The decision making requires the context in which the sentence occurs. Unfortunately, however, such context is normally omitted or ignored in linguistic literature even when the anaphor-antecedent referential questions like the ones discussed in this paper, are dealt with. In discussing such questions, linguists should be much more aware of the important role the discourse plays.[7]

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[7]Zribi-Hertz(1989), and Ward, Sproat,& McKoon(1991) are among the few who take discourse into serious consideration in dealing with the nature of anaphor binding. Both challenge the Principle A, claiming that the analysis under the Binding Theory is incomplete on a point that it lacks in the consideration of discourse.

Now before closing the section, let's re-examine the sentence (1), employing the Proper Binding Statement, in order to confirm my claim. The sentence is repeated here as (12) for convenience.[8]

				jibun $?_{i/j/*k}$	
(12) John$_i$-ga	[Bill$_j$-ga	Mike$_k$-ni		jibun-jishin$?_{i/j/*k}$	-no
				kare-jishin$?_{i/j/k}$	
John NOM	Bill NOM	Mike DAT			GEN
koto-o	hanashita		to]	itta.	
thing ACC	told		COMP	said	

'John said that Bill told Mike about self.'

First, in the lower clause assigned g by the Proper Binding Statement, each of the reflexives tries to find feature matching nouns/pronouns to correctly identify its potential antecedents. *Jibun* and *jibun-jishin*, for example, sharing the same Agreement features [+human][+male][+subject referring], will pick up only *Bill*, and *kare-jishin*, which has [-subject referring], will choose both *Bill* and *Mike*. The choice between the two is a matter of discourse.

Having succeeded in identifying their respective antecedent, the reflexives will stop their search for other potential antecedents, with g remaining in the lower clause. However, if the discourse prohibits the reflexives from referring to these potential antecedents in the lower clause, the Proper Binding Statement re-assigns g to the higher clause, where the reflexives are allowed to look for other potential antecedents.

All of the reflexives in question can pick up *John* as their antecedent because of the same Agreement features, and again, if the discourse allows the co-reference there, the reflexives are properly bound in the new g, and if not, they are not properly bound, creating not a 'ambiguous' but an 'unacceptable' and 'ungrammatical' sentence. The mark '?' is placed for all of the reflexives simply because we cannot infer the discourse constraint, i.e., we cannot judge if the discourse requires us to assign g to the higher clause, just by looking at this sentence. Such information is necessary but lacking here, therefore (12) is judged as an 'ambiguous' sentence, but not an 'unacceptable' or 'ungrammatical' sentence.

Although, it may not be able to completely replace the Binding Theory, the notion of Proper Binding, as shown in the above discussion of the Japanese reflexives, provides us with a powerful 'interface between the form of the grammar and its use in discourse pragmatics' (Torres, 1991: 1).

Moreover, it should be also noted that as for the Japanese examples used in this paper, some of which are fairly complex with respect to syntactic and semantic structures, proper binding has been proved to be not merely powerful enough to be a supplement to the Binding Theory but, in fact, more powerful in explaining the linguistic phenomena involving reflexives than the Binding Theory.

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[8]The acceptability judgement made here is mine.

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